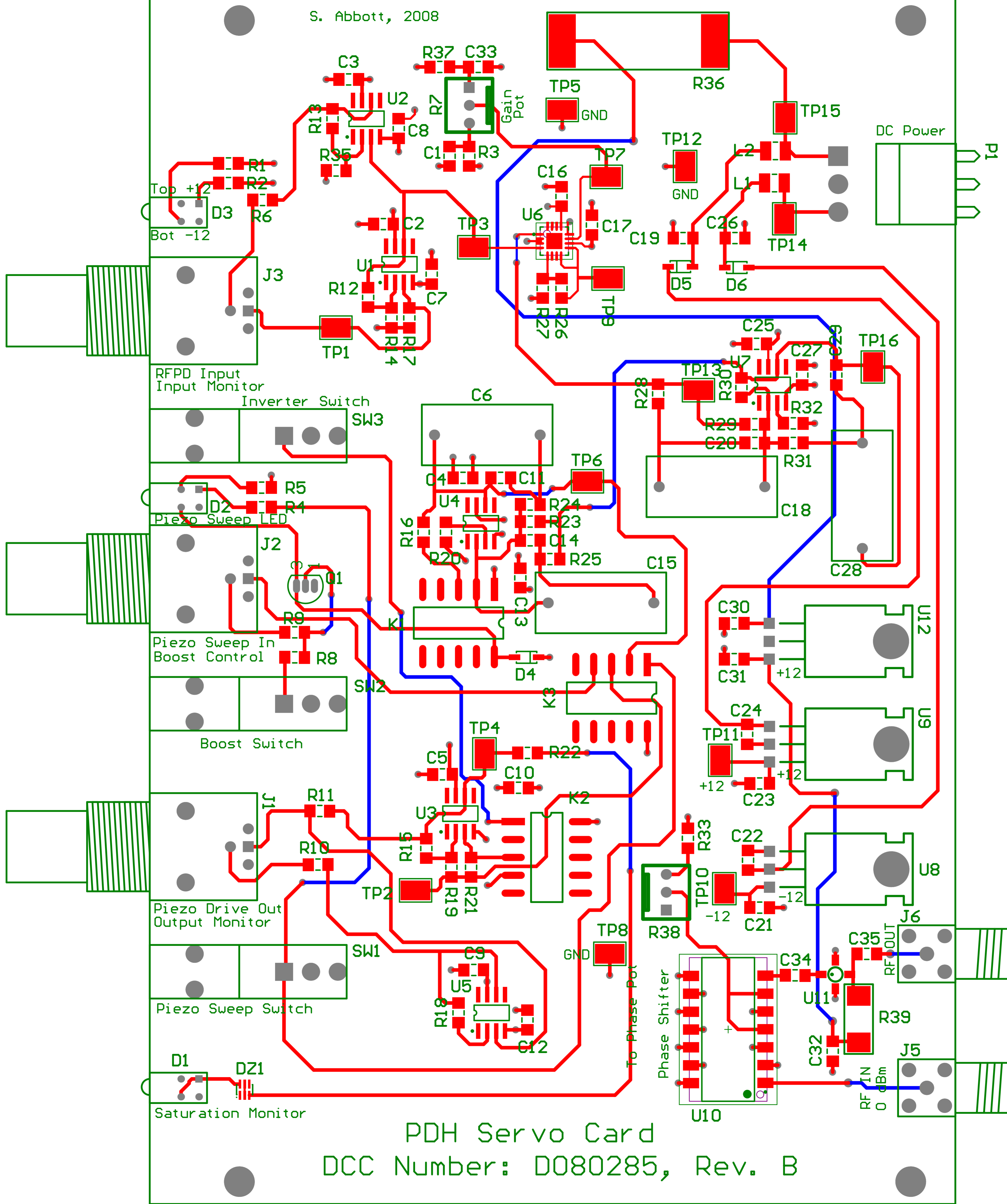
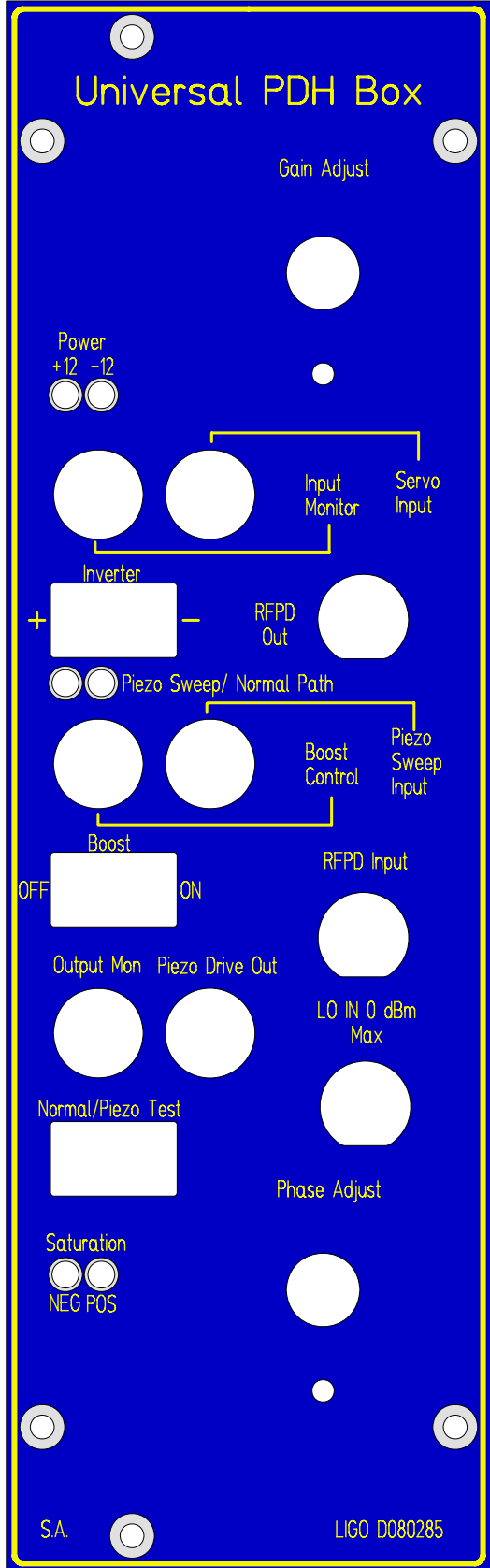


Title		Universal PDH Box		LIGO Laboratory California Institute of Technology Massachusetts Institute of Technology		LIGO	
Size: B	DCC Number: D080285	Revision: B	Engineer: S. Abbott	Date: 6/27/2008	Time: 3:26:37 PM		
File: C:\Rich's Files\Mycadfiles\PDH_Box\pdh_b.SchDoc				Last Edited: 3 June 2008			
				Sheet 1 of 1			



PDH Servo Card
DCC Number: D080285, Rev. B

+12 and -12 power LEDs were engraved backwards on the initial design. +12 should be on the right, -12 on the left. This was fixed after the prototype panels were ordered.



Designator	Comment	Description	Digikey Part Number	Quantity	Manufacturers Part Number	Value
C1	1UF		PCC2234CT-ND	1		1UF
C2	1UF		PCC2234CT-ND	1		1UF
C3	1UF		PCC2234CT-ND	1		1UF
C4	1UF		PCC2234CT-ND	1		1UF
C5	1UF		PCC2234CT-ND	1		1UF
C6	3.3UF		EF1335-ND	1		3.3UF
C7	1UF		PCC2234CT-ND	1		1UF
C8	1UF		PCC2234CT-ND	1		1UF
C9	1UF		PCC2234CT-ND	1		1UF
C10	1UF		PCC2234CT-ND	1		1UF
C11	OMIT			1		OMIT
C12	1UF		PCC2234CT-ND	1		1UF
C13	1UF		PCC2234CT-ND	1		1UF
C14	OMIT			1		OMIT
C15	3.3UF		EF1335-ND	1		3.3UF
C16	1UF		PCC2234CT-ND	1		1UF
C17	1UF		PCC2234CT-ND	1		1UF
C18	3.3UF		EF1335-ND	1		3.3UF
C19	1UF		PCC2234CT-ND	1		1UF
C20	OMIT		PCC2234CT-ND	1		OMIT
C21	1UF		PCC2234CT-ND	1		1UF
C22	1UF		PCC2234CT-ND	1		1UF
C23	1UF		PCC2234CT-ND	1		1UF
C24	1UF		PCC2234CT-ND	1		1UF
C25	1UF		PCC2234CT-ND	1		1UF
C26	1UF		PCC2234CT-ND	1		1UF
C27	1UF		PCC2234CT-ND	1		1UF
C28	3.3UF		EF1335-ND	1		3.3UF
C29	OMIT			1		OMIT
C30	1UF		PCC2234CT-ND	1		1UF
C31	1UF		PCC2234CT-ND	1		1UF
C32	1000pF		PCC2009CT-ND	1		1000pF
C33	1UF		PCC2234CT-ND	1		1UF
C34	1000pF		PCC2009CT-ND	1		1000pF
C35	1000pF		PCC2009CT-ND	1		1000pF
D1	Stacked RED LED	Dual Green LED	67-1319-ND	1		
D2	Stacked RED LED	Dual Green LED	67-1319-ND	1		
D3	Stacked GREEN LED	Dual Green LED	67-1321-ND	1		
D4	60V, 1A Schottky	Default Diode	RB160M-60CT-ND	1		
D5	60V, 1A Schottky	Default Diode	RB160M-60CT-ND	1		
D6	60V, 1A Schottky	Default Diode	RB160M-60CT-ND	1		
DZ1	7.5V ZENER	Zener_Dual	BZX84C7V5SDICT-ND	1		
J1	BNC	Stacked Dual BNC		1	31202-HW-50 @ www.pscelex.com	
J2	BNC	Stacked Dual BNC		1	31202-HW-50 @ www.pscelex.com	
J3	BNC	Stacked Dual BNC		1	31202-HW-50 @ www.pscelex.com	
J5	SMA	SMA Connector		1	31202-HW-50 @ www.pscelex.com	
J6	SMA	SMA Connector		1	31202-HW-50 @ www.pscelex.com	
K1	RELAY_G6H		Z828-ND	1		
K2	RELAY_G6H		Z828-ND	1		
K3	RELAY_G6H		Z828-ND	1		
L1	10UH		PCD1817CT-ND	1		10UH
L2	10UH		PCD1817CT-ND	1		10UH
P1	Header 3H	Header, 3-Pin, Right Angle	WM5236-ND	1		
Q1	2N3904	NPN General Purpose Amplifier	2N3904RLRMGOSCT-ND	1		
R1	1k		P1.00KFCT-ND	1		1k
R2	1k		P1.00KFCT-ND	1		1k
R3	187K		P187KFCT-ND	1		187K
R4	1k		P1.00KFCT-ND	1		1k
R5	1k		P1.00KFCT-ND	1		1k
R6	49.9		P49.9FCT-ND	1		49.9
R7	10K	Potentiometer	P10.0KFCT-ND	1		10K
R8	10K		P10.0KFCT-ND	1		10K
R9	1k		P1.00KFCT-ND	1		1k
R10	49.9		P49.9FCT-ND	1		49.9
R11		Resistor	P10.0FCT-ND	1		10
R12	1k		P1.00KFCT-ND	1		1k
R13	1k		P1.00KFCT-ND	1		1k
R14	1k		P1.00KFCT-ND	1		1k
R15		Resistor	P10.0KFCT-ND	1		10K
R16	10K		P10.0KFCT-ND	1		10K

R17	49.9		P49.9FCT-ND	1		49.9
R18	1k		P1.00KFCT-ND	1		1k
R19		Resistor	P10.0KFCT-ND	1		10K
R20	1k		P1.00KFCT-ND	1		1k
R21		Resistor	P10.0KFCT-ND	1		10K
R22	200		P200FCT-ND	1		200
R23	1k		P1.00KFCT-ND	1		1k
R24	10		P10.0FCT-ND	1		10
R25	OMIT		P1.00KFCT-ND	1		OMIT
R26		Resistor	P1.00KFCT-ND	1		1k
R27		Resistor	P1.00KFCT-ND	1		1k
R28	OMIT		P1.00KFCT-ND	1		OMIT
R29		Resistor	P1.00KFCT-ND	1		1k
R30		Resistor	P1.00KFCT-ND	1		1k
R31	10		P10.0FCT-ND	1		10
R32		Resistor	P1.00KFCT-ND	1		1k
R33	0		P0.0ECT-ND	1		0
R35	1k		P1.00KFCT-ND	1		1k
R36	150		ALSR3J-150-ND	1		150
R37	187K		P187KFCT-ND	1		187K
R38	10K	Potentiometer	P10.0KFCT-ND	1		10K
R39	110, 1Watt	Resistor	PT110AFCT-ND	1		110
SW1	SPDT	Rocker SPDT	450-1518-ND	1		
SW2	SPDT	Rocker SPDT	450-1518-ND	1		
SW3	SPDT	Rocker SPDT	450-1518-ND	1		
TP1	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP2	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP3	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP4	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP5	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP6	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP7	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP8	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP9	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP10	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP11	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP12	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP13	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP14	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP15	TESTPT	PCB Testpoint	5016KCT-ND	1		
TP16	TESTPT	PCB Testpoint	5016KCT-ND	1		
U1	ADOP27AQ	Ultra-Low Noise, Precision Operational Amplifier	OP27GS-ND	1		
U2	ADOP27AQ	Ultra-Low Noise, Precision Operational Amplifier	OP27GS-ND	1		
U3	ADOP27AQ	Ultra-Low Noise, Precision Operational Amplifier	OP27GS-ND	1		
U4	LF356AN8	JFET-Input High-Speed Operational Amplifier	LF356M-ND	1		
U5	ADOP27AQ	Ultra-Low Noise, Precision Operational Amplifier	OP27GS-ND	1		
U6	AD8336	Variable Gain Amplifier	AD8336ACPZ-R7CT-ND	1		
U7	ADOP27AQ	Ultra-Low Noise, Precision Operational Amplifier	OP27GS-ND	1		
U8	MC7912ACT	Three-Terminal Negative Voltage Regulator	MC7912CTOS-ND	1		
U9	MC78M12ACT	Three-Terminal Medium Current Positive Voltage Regulator	MC78M12CTGOS-ND	1		
U10	JSPHS-26	18 to 26 MHZ PHASE SHIFTER		1	JSPHS-26 @ www.minicircuits.com	
U11	ERA-AMP	MINI CIRCUITS ERA AMPLIFIER		1	ERA-5SM+ @ www.minicircuits.com	
U12	MC78M12ACT	Three-Terminal Medium Current Positive Voltage Regulator	MC78M12CTGOS-ND	1		

Coaxial Frequency Mixer

ZX05-1MHW+ ZX05-1MHW

Level 13 (LO Power +13 dBm) 0.5 to 600 MHz



CASE STYLE: FL905

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	200mW
IF Current	40mA

Coaxial Connections

LO	1
RF	2
IF	3

Features

- rugged construction
- small size
- low conversion loss
- high L-R isolation
- protected by US Patents 6,133,525 & 6,790,049

Applications

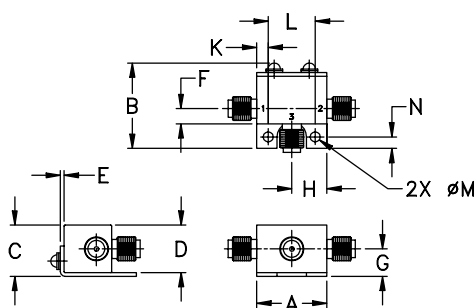
- cellular
- PCS
- instrumentation
- satellite communication

Connectors	Model	Price	Qty.
SMA	ZX05-1MHW-S(+)	\$39.95 ea.	(1-24)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

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

Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.74	.90	.54	.50	.04	.16	.29
18.80	22.86	13.72	12.70	1.02	4.06	7.37
H	J	K	L	M	N	wt
.37	--	.122	.496	.106	.122	grams
9.40	--	3.10	12.60	2.69	3.10	20.0

Electrical Specifications (T_{AMB}=25°C)

FREQUENCY (MHz)	CONVERSION LOSS (dB)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			IP3 at center band (dBm)						
		L	M	U	L	M	U							
0.5-600	DC-600	63	50	53	32	43	20	56	40	44	25	30	20	17

1 dB COMP.: +9 dBm typ.

L = low range [f_l to 10 f_l]

m = mid band [2f_l to f_l/2]

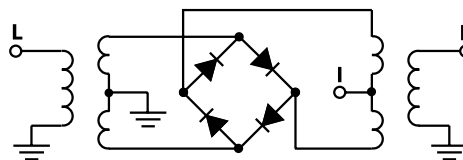
M = mid range [10 f_l to f_l/2]

U = upper range [f_l/2 to f_l]

Typical Performance Data

Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +13dBm	LO +13dBm	LO +13dBm	LO +13dBm	LO +13dBm
0.51	30.51	6.90	65.03	59.15	1.94	2.72
35.10	65.10	5.20	57.24	54.53	1.07	2.37
75.10	45.10	5.20	51.59	49.29	1.09	2.32
100.10	70.10	5.21	49.55	46.80	1.10	2.34
136.65	106.65	5.14	47.71	44.52	1.13	2.36
186.31	156.31	5.20	45.43	42.16	1.17	2.37
219.41	189.41	5.21	44.63	41.28	1.20	2.43
252.51	222.51	5.25	43.63	40.19	1.23	2.44
285.62	255.62	5.27	42.50	39.17	1.26	2.44
318.72	288.72	5.26	42.63	38.66	1.28	2.53
351.82	321.82	5.35	41.96	37.65	1.31	2.44
384.93	354.93	5.41	40.38	36.31	1.34	2.52
418.03	388.03	5.39	39.35	34.63	1.39	2.58
451.13	421.13	5.53	37.97	34.45	1.43	2.52
484.24	454.24	5.58	36.94	33.38	1.45	2.63
500.79	470.79	5.58	36.54	33.15	1.45	2.59
533.89	503.89	5.69	35.79	32.80	1.43	2.46
550.45	520.45	5.74	35.31	32.18	1.41	2.49
583.55	553.55	5.74	35.05	30.26	1.38	2.66
600.10	570.10	5.72	35.01	29.30	1.38	2.64

Electrical Schematic



Mini-Circuits
ISO 9001 ISO 14001 CERTIFIED

ALL NEW
minicircuits.com

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site

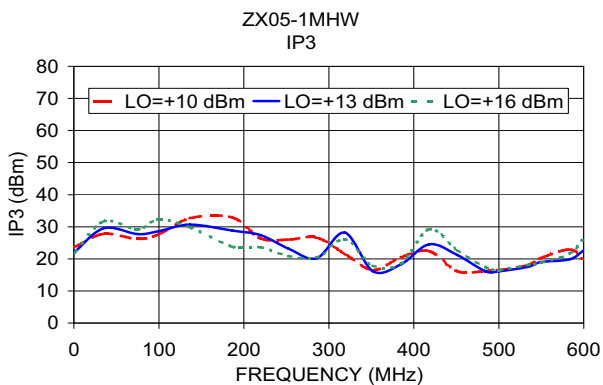
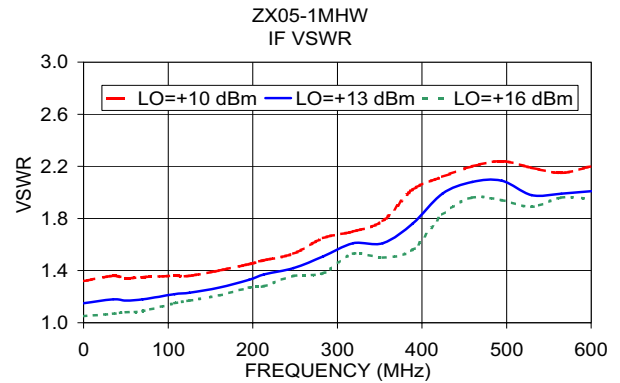
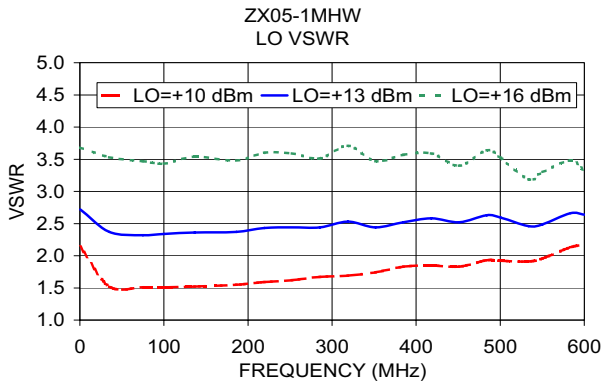
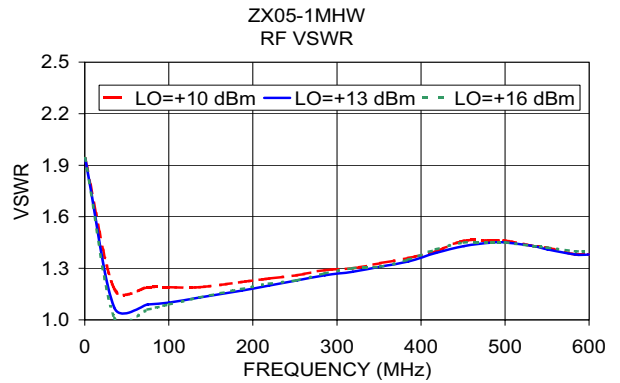
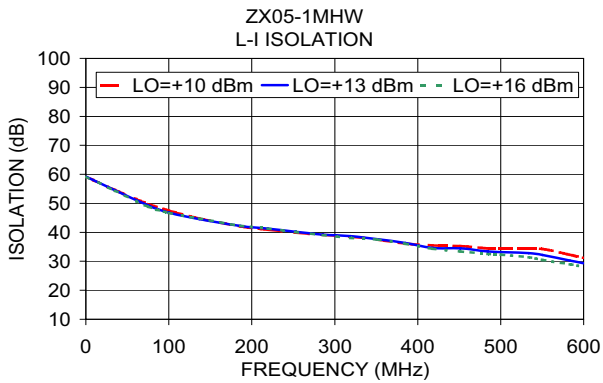
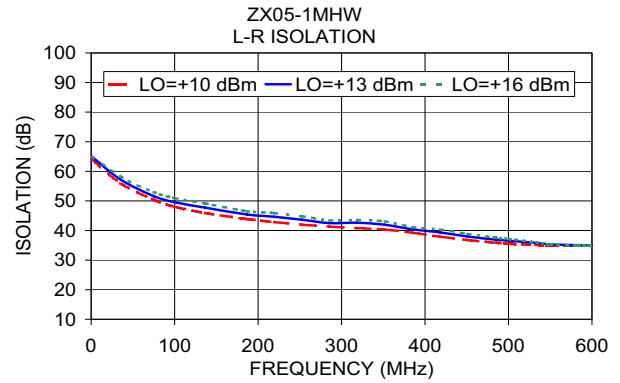
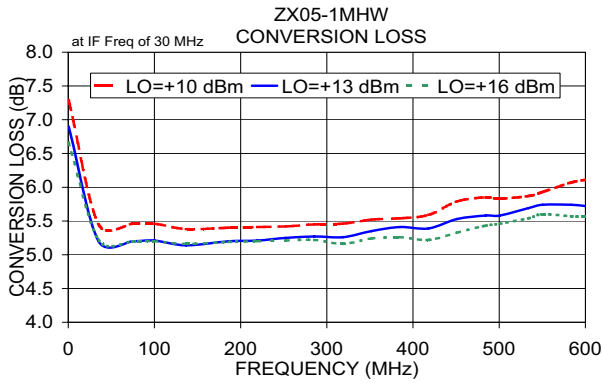


The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

REV. C
M100492
ZX05-1MHW
RVN/TD/CP
070612

Performance Charts



Surface Mount

Monolithic Amplifier

DC-4 GHz

Product Features

- DC-4 GHz
- Single Voltage Supply
- Internally matched to 50 Ohm
- Unconditionally Stable
- Low Performance Variation Over Temperature
- Transient protected
- Aqueous washable
- Protected by US Patent 6,943,629



ERA-5SM+

CASE STYLE: WW107
PRICE: \$3.90 ea. QTY. (30)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

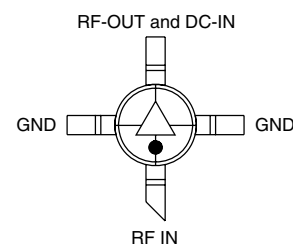
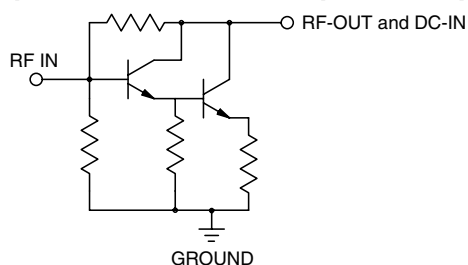
Typical Applications

- Cellular/ PCS/ 3G Base Station
- CATV, Cable Modem & DBS
- Fixed Wireless & WLAN
- Microwave Radio & Test Equipment

General Description

ERA-5SM+ (RoHS compliant) is a wideband amplifier offering high dynamic range. It has repeatable performance from lot to lot. It is enclosed in an Micro-X package. ERA-5SM+ uses Darlington configuration and is fabricated using InGaP HBT technology. Expected MTBF is 850 years at 85°C case temperature.

simplified schematic and pin description



Function	Pin Number	Description
RF IN	1	RF input pin. This pin requires the use of an external DC blocking capacitor chosen for the frequency of operation.
RF-OUT and DC-IN	3	RF output and bias pin. DC voltage is present on this pin; therefore a DC blocking capacitor is necessary for proper operation. An RF choke is needed to feed DC bias without loss of RF signal due to the bias connection, as shown in "Recommended Application Circuit".
GND	2,4	Connections to ground. Use via holes as shown in "Suggested Layout for PCB Design" to reduce ground path inductance for best performance.

Mini-Circuits®
ISO 9001 ISO 14001 CERTIFIED

ALL NEW
minicircuits.com

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

Rev. N
M108520
ERA-5SM+
070119
Page 1 of 4

Electrical Specifications at 25°C and 65mA, unless noted

Parameter		Min.	Typ.	Max.	Units	Cpk
Frequency Range*		DC		4	GHz	
Gain	f=0.1GHz	19	20.2	22	dB	≥1.5
	f=1 GHz		19.5			
	f=2 GHz	16	17.6	19		
	f=3 GHz		15.6			
	f=4 GHz	12	14	16		
Magnitude of Gain Variation versus Temperature (values are negative)	f=0.1GHz		.0025	.005	dB/°C	
	f=1 GHz		.0034	.007		
	f=2 GHz		.0043	.0085		
	f=3 GHz		.0052	.0105		
	f=4 GHz		.0065	.013		
Input Return Loss	f=0.1 GHz		21		dB	
	f=2 GHz		23			
	f=4 GHz		21			
Output Return Loss	f=0.1 GHz		30		dB	
	f=2 GHz		26			
	f=4 GHz		17			
Reverse Isolation	f=2 GHz	19	22		dB	
Output Power @1 dB compression	f=0.1 GHz	16.5	18.4		dBm	≥1.5
	f=1 GHz	16.5	18.4			
	f=2 GHz	15.5	17			
	f=4 GHz		12.5			
Saturated Output Power (at 3dB compression)	f=0.1 GHz		19.5		dBm	
	f=1 GHz		18.5			
	f=2 GHz		18			
Output IP3	f=0.1 GHz	30	33		dBm	≥1.5
	f=1 GHz	30	33			
	f=2 GHz	26	30			
	f=4 GHz		26			
Noise Figure	f=0.1GHz		3.5	4.5	dB	≥1.5
	f=2 GHz		3.5	4.5		
	f=4 GHz		3.5	4.5		
Group Delay	f=2 GHz		90		psec	
Recommended Device Operating Current			65		mA	
Device Operating Voltage		4.5	4.9	5.3	V	≥1.5
Device Voltage Variation vs. Temperature at 65mA			-3.2		mV/°C	
Device Voltage Variation vs. Current at 25°C			6.9		mV/mA	
Thermal Resistance, junction-to-case ¹			133		°C/W	

*Guaranteed specification DC-4 GHz. Low frequency cut off determined by external coupling capacitors.

Absolute Maximum Ratings

Parameter	Ratings
Operating Temperature*	-45°C to 85°C
Storage Temperature	-65°C to 150°C
Operating Current	120mA
Power Dissipation	650mW
Input Power	13 dBm

Note: Permanent damage may occur if any of these limits are exceeded.

These ratings are not intended for continuous normal operation.

¹Case is defined as ground leads.

*Based on typical case temperature rise 10°C above ambient.



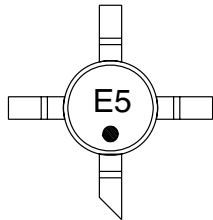
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

Product Marking



Additional Detailed Technical Information

Additional information is available on our web site. To access this information enter the model number on our web site home page.

Performance data, graphs, s-parameter data set (.zip file)

Case Style: WW107

Plastic micro-x, .085 body diameter, lead finish: tin/silver/nickel

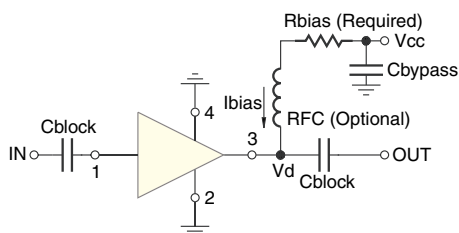
Tape & Reel: F4

Suggested Layout for PCB Design: PL-075

Evaluation Board: TB-408-5+

Environmental Ratings: ENV08T2

Recommended Application Circuit



Test Board includes case, connectors, and components (in bold) soldered to PCB

R BIAS	
Vcc	"1%" Res. Values (ohms) for Optimum Biasing
7	33.2
8	48.7
9	63.4
10	78.7
11	95.3
12	110
13	124
14	140
15	158
16	174
17	187
18	205
19	221
20	232

ESD Rating

Human Body Model (HBM): Class 1B (500 v to < 1,000 v) in accordance with ANSI/ESD STM 5.1 - 2001

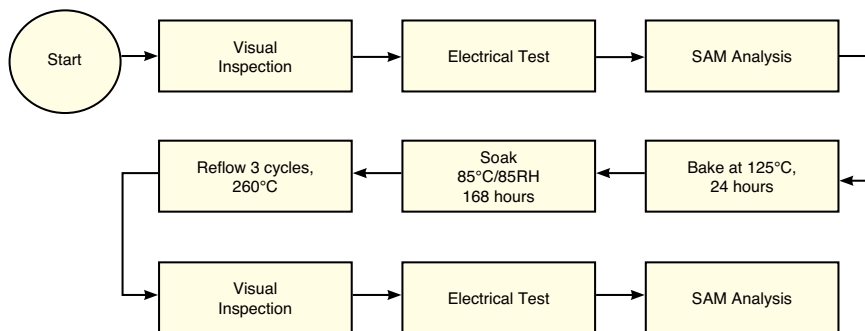
Machine Model (MM): Class M1 (< 100 v) in accordance with ANSI/ESD STM 5.2 - 1999

MSL Rating

Moisture Sensitivity: MSL1 in accordance with IPC/JEDECJ-STD-020C

NO.	TEST REQUIRED	CONDITION	STANDARD	QUANTITY
1	Visual Inspection	Low Power Microscope Magnification 40x	MIP-IN-0003 (MCT spec)	45 units
2	Electrical Test	Room Temperature	SCD (MCL spec)	45 units
3	SAM Analysis	Less than 10% growth in term of delamination	J-Std-020C (Jedec Standard)	45 units
4	Moisture Sensitivity Level 1	Bake at 125°C for 24 hours Soak at 85°C/85%RH for 168 hours Reflow 3 cycles at 260°C peak	J-Std-020C (Jedec Standard)	45 units

MSL Test Flow Chart



Narrow Band Phase Shifter

JSPHS-26

50Ω 180° Voltage Variable 18 to 26 MHz



CASE STYLE: BK276
PRICE: \$29.95 ea. QTY (1-9)

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Input Power	20 dBm max.
Control Voltage	12V

Pin Connections

IN	1
OUT	7
BIAS	4,6^
GROUND	2,3,5,8,9,10,11,12,13,14

^ pins must be connected together externally

Features

- low insertion loss, 1.2 dB typ.
- good VSWR, 1.3:1 typ.
- solder-plated J-leads for excellent solderability and strain relief
- aqueous washable

Applications

- IF signal processing

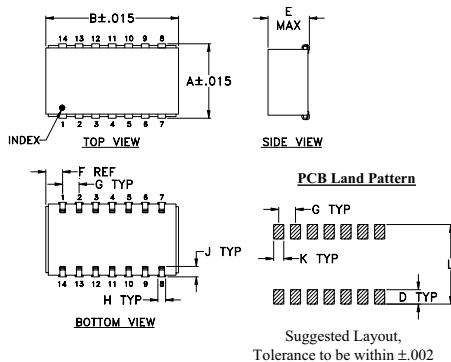
Phase Shifter Electrical Specifications

FREQUENCY (MHz)	PHASE RANGE (Degrees)	INSERTION LOSS (dB)		CONTROL VOLTAGE (V)	CONTROL BANDWIDTH (kHz)	VSWR (:1)	
		Typ.	Max.			Typ.	Max.
18-26	180	1.2	3.0	0-12	DC-50	1.2	1.7

Maximum operating power, 0 dBm

DC input resistance at Control port: 2000 ohms typ.

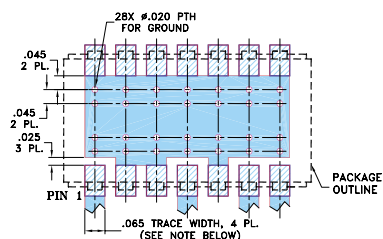
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.450	.803	--	.100	.250	.102	.100
11.43	20.40	--	2.54	6.35	2.59	2.54
H	J	K	L		wt	
.047	.065	.065	.470		grams	
1.19	1.65	1.65	11.94		3.0	

Demo Board MCL P/N: TB-122 Suggested PCB Layout (PL-030)

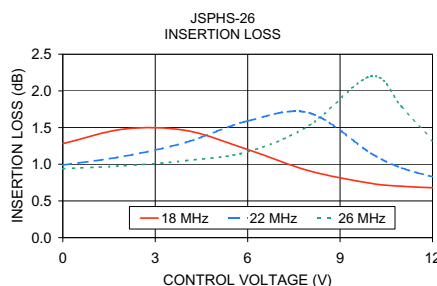
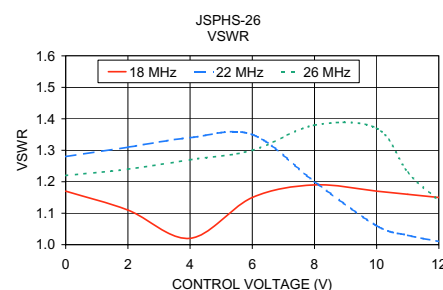
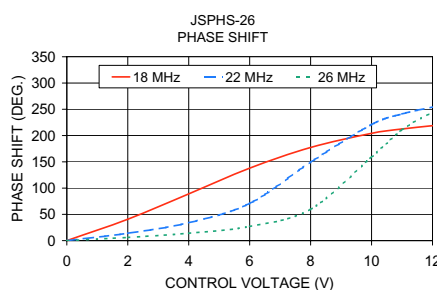


- NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
 - DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

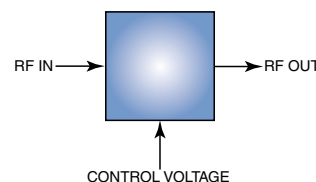
Typical Performance Data

Control Voltage (V)	Phase Shift* (Degrees)			VSWR (:1)			Insertion Loss (dB)		
	18 MHz	22 MHz	26 MHz	18 MHz	22 MHz	26 MHz	18 MHz	22 MHz	26 MHz
0.00	0.00	0.00	0.00	1.17	1.28	1.22	1.28	0.99	0.94
2.00	40.75	14.16	6.22	1.11	1.31	1.24	1.48	1.11	0.98
4.00	89.04	34.13	14.10	1.02	1.34	1.27	1.46	1.30	1.05
6.00	137.90	70.92	27.04	1.15	1.35	1.30	1.20	1.59	1.17
8.00	177.31	149.42	59.86	1.19	1.20	1.38	0.91	1.70	1.53
10.00	204.19	221.13	159.17	1.17	1.06	1.37	0.74	1.15	2.20
11.00	212.53	241.18	210.92	1.16	1.03	1.23	0.70	0.95	1.78
12.00	218.74	254.46	245.15	1.15	1.01	1.14	0.68	0.83	1.32

* Normalized at control voltage = 0V



electrical schematic



Mini-Circuits
ISO 9001 ISO 14001 CERTIFIED

ALL NEW
minicircuits.com

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

REV. A
M102713
JSPHS-26
HY/TD/CP/AM
080415

Coaxial Low Pass Filter

SLP-30+

50Ω DC to 32 MHz

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.5W max.

Features

- good attenuation rate, 1.35 typ. 20dB/ 3dB BW ratio
- rugged shielded case
- other SLP models available with wide selection of cut-off frequencies

Applications

- lab use
- test equipment
- video equipment



CASE STYLE: FF99

Connectors	Model	Price	Qty.
SMA	SLP-30+	\$34.95 ea.	(1-9)

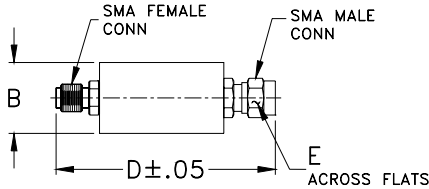
+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

Low Pass Filter Electrical Specifications

PASSBAND (MHz)	fco (MHz) Nom.	STOPBAND (MHz)		VSWR (:1)	
		(loss > 20 dB)	(loss > 40 dB)	Passband Typ.	Stopband Typ.
DC-32	35	47-61	61-200	1.7	18

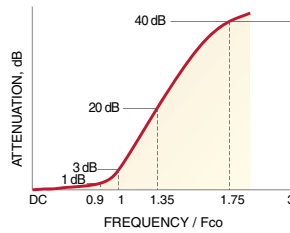
Outline Drawing



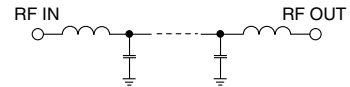
Outline Dimensions (inch/mm)

B	D	E	wt
.67	1.98	.312	grams
17.02	50.29	7.92	42.0

typical frequency response

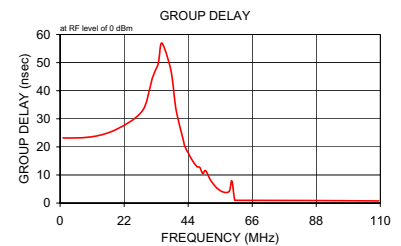
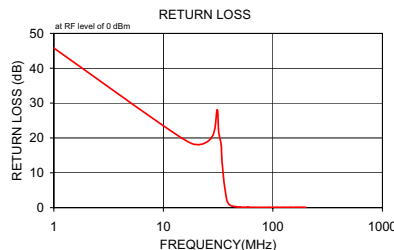
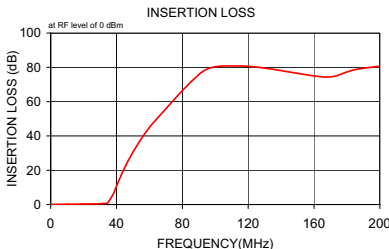


electrical schematic



Typical Performance Data

Frequency (MHz)	Insertion Loss (dB)		Return Loss (dB)	Frequency (MHz)	Group Delay (nsec)
	\bar{x}	σ			
1.00	0.07	0.1	45.8	1.00	23.20
10.00	0.21	0.1	23.5	10.00	23.47
19.00	0.29	0.1	18.2	19.00	26.06
28.00	0.37	0.1	20.4	28.00	32.45
31.00	0.48	0.1	28.1	31.00	41.59
32.00	0.55	0.1	21.8	32.00	45.56
33.50	0.62	0.1	18.8	33.50	48.79
34.00	0.76	0.1	16.1	34.00	51.33
35.00	1.30	0.3	9.9	35.00	56.96
38.00	6.09	0.9	2.1	38.00	47.73
40.00	10.78	0.9	0.9	39.00	39.87
43.00	17.56	0.8	0.4	40.00	32.35
45.00	21.65	0.7	0.3	42.00	23.79
46.00	23.56	0.7	0.3	43.00	19.72
47.00	25.39	0.7	0.2	44.00	17.97
48.00	27.19	0.7	0.2	45.00	15.87
50.00	30.58	0.6	0.2	46.00	14.29
55.00	38.32	0.6	0.1	47.00	12.98
59.00	43.69	0.7	0.2	48.00	12.68
60.00	45.01	0.7	0.1	49.00	10.48
61.00	46.27	0.5	0.1	50.00	11.50
91.50	76.88	4.1	0.1	52.00	7.62
109.50	80.77	5.3	0.1	55.00	4.41
127.50	79.89	2.8	0.1	58.00	4.04
145.50	77.20	3.0	0.1	59.00	7.93
164.00	74.52	3.4	0.1	60.00	1.04
173.00	74.92	3.8	0.1	61.00	0.99
182.00	78.05	5.9	0.1	91.50	0.88
191.00	79.62	6.8	0.1	100.50	0.79
200.00	80.65	6.9	0.1	109.50	0.75



Mini-Circuits®
ISO 9001 ISO 14001 CERTIFIED

ALL NEW
minicircuits.com

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

REV. B
M113397
SLP-30+
071029