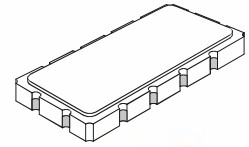





**PX1002**

**86.85 MHz  
SAW Filter**



**SM13365-12**

- **Designed for TDMA IS-54 Receiver IF Applications**
- **Low Insertion Loss**
- **Excellent Selectivity**
- **Hermetic 13.3 X 6.5 mm Surface-Mount Case**
- **Unbalanced Input and Output**
- **Complies with Directive 2002/95/EC (RoHS)** 

**Absolute Maximum Ratings**

Rating	Value	Units
Maximum Incident Power in Passband	+10	dBm
Max. DC voltage between any 2 terminals	30	VDC
Storage Temperature Range	-40 to +85	°C
Suitable for lead-free soldering - Max Soldering Profile	260°C for 30 s	

**Electrical Characteristics**


Characteristic	Sym	Notes	Min	Typ	Max	Units	
Nominal Center Frequency	$f_c$	1		86.850		MHz	
Passband Insertion Loss at $f_c$ 3 dB Passband Amplitude Ripple over $f_c \pm 15$ kHz Group Delay Variation over $f_c \pm 10$ kHz	IL	1, 2		3	4.0	dB	
	$BW_3$		$\pm 12$	$\pm 25$		kHz	
					1.0		dB <sub>p-p</sub>
					6.0		$\mu$ s <sub>p-p</sub>
Third-Order Intermod. for -20 dBm tones at $f_c \pm 60$ & 120 kHz					-95	dBm	
Rejection $f_c \pm 60$ kHz $f_c - 880$ kHz to $f_c - 940$ kHz Ultimate		1, 2, 3	11	16		dB	
			65				
				65			
Operating Temperature Range	$T_A$	1	-20		+70	°C	

Impedance Matching to 50 $\Omega$ unbalanced	External L-C
Case Style	SM13365-12 13.3 X 6.5 mm Nominal Footprint
Lid Symbolization (YY=year, WW=week) See note 4	RFM PX1002 YYWW

**Electrical Connections**

Connection	Terminals
Port 1 Hot	2
Port 1 Gnd Return	3
Port 2 Hot	8
Port 2 Gnd Return	9
Case Ground	All Others

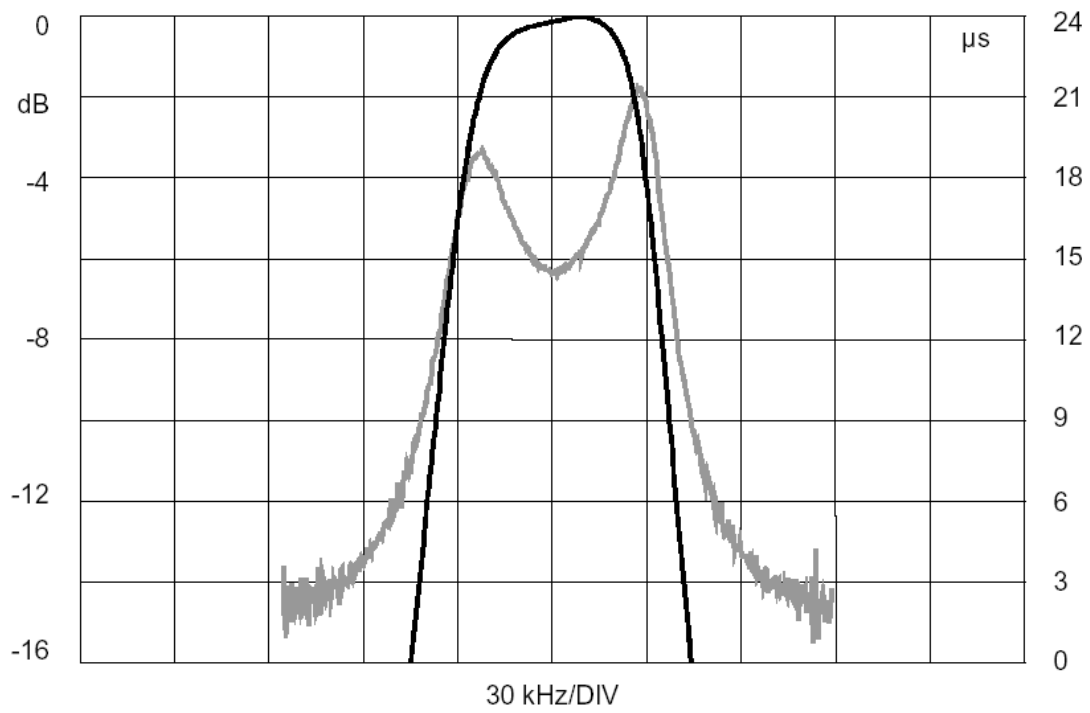
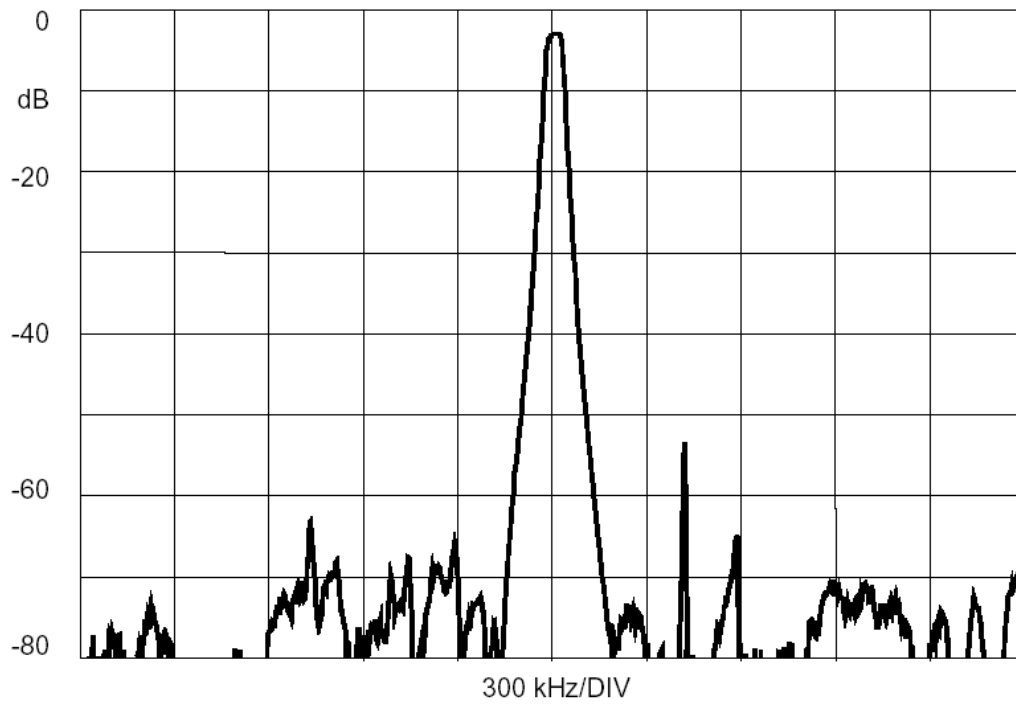
**Notes:**

1. Unless noted otherwise, all specifications apply over the operating temperature range with filter soldered to the specified demonstration board with impedance matching to 50  $\Omega$  and measured with 50  $\Omega$  network analyzer.
2. Unless noted otherwise, all frequency specifications are referenced to the nominal center frequency,  $f_c$ .
3. Rejection is measured as attenuation below the minimum IL point in the passband. Rejection in final user application is dependent on PCB layout and external impedance matching design. See Application Note No. 42 for details.
4. "LRIP" or "L" after the part number indicates "low rate initial production" and "ENG" or "E" indicates "engineering prototypes."
5. The design, manufacturing process, and specifications of this filter are subject to change.
6. Either Port 1 or Port 2 may be used for either input or output in the design. However, impedances and impedance matching may vary between Port 1 and Port 2, so that the filter must always be installed in one direction per the circuit design.
7. US and international patents may apply.
8. RFM, stylized RFM logo, and RF Monolithics, Inc. are registered trademarks of RF Monolithics, Inc.
9. ©Copyright 1999, RF Monolithics Inc.
10. Electrostatic Sensitive Device. Observe precautions for handling 



**86.85 MHz**

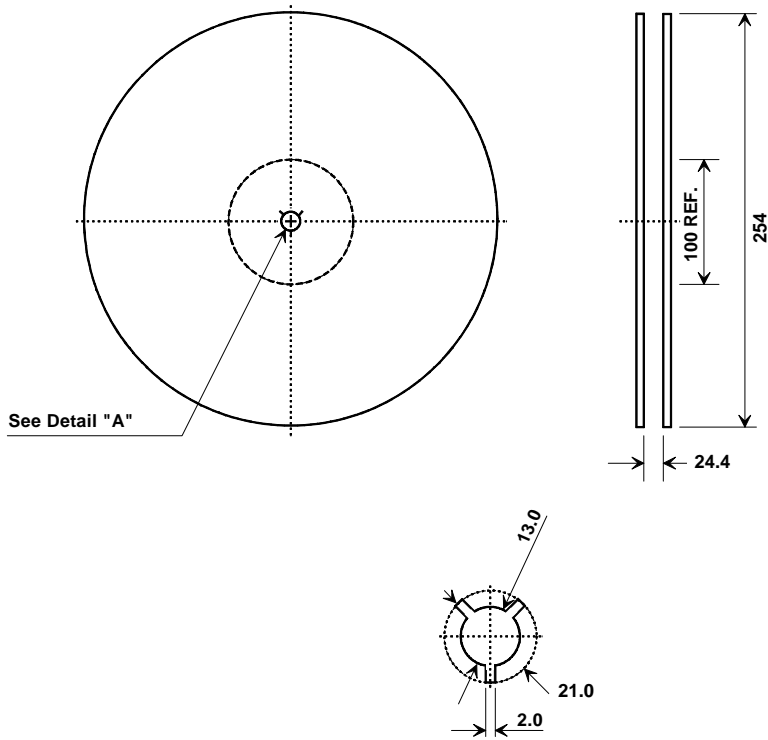
**SAW Filter**



# 86.85 MHz

# SAW Filter

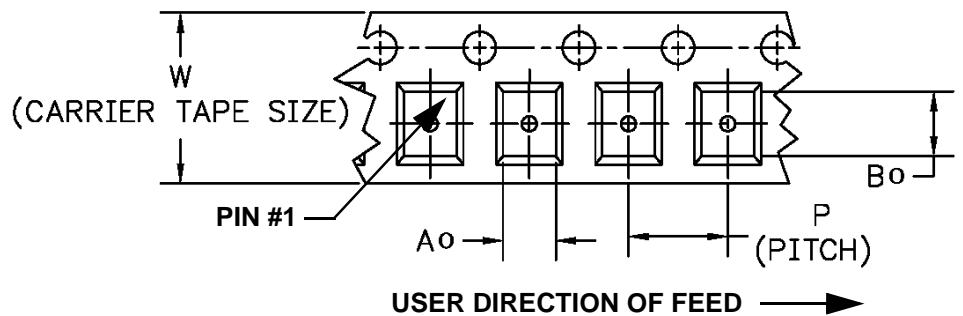
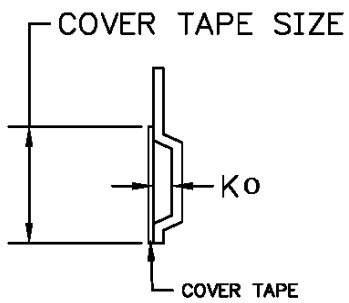
## Tape and Reel Specifications



Quantity Per Reel	
100 Min	
1000 Max	

## COMPONENT ORIENTATION and DIMENSIONS

Carrier Tape Dimensions	
<b>Ao</b>	7.0 mm
<b>Bo</b>	13.8 mm
<b>Ko</b>	2.0 mm
<b>Pitch</b>	12.0 mm
<b>W</b>	24.0 mm

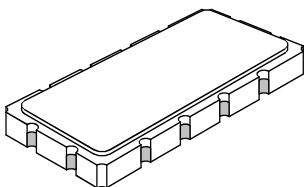


# 86.85 MHz

# SAW Filter

## SM13365-12 Case

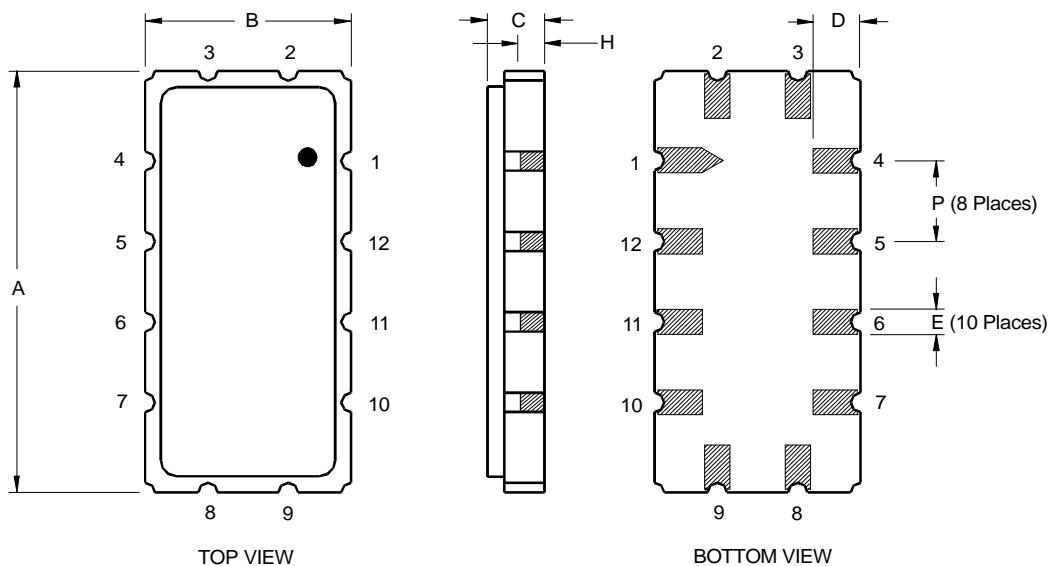
**12-Terminal Ceramic Surface-Mount Case**  
**13.3 x 6.5 mm Nominal Footprint**



Case Dimensions						
Dimension	mm			Inches		
	Min	Nom	Max	Min	Nom	Max
A	13.08	13.31	13.60	0.515	0.524	0.535
B	6.27	6.50	6.80	0.247	0.256	0.268
C		1.91	2.00		0.075	0.079
D		1.50			0.059	
E		0.79			0.031	
H		1.0			0.039	
P		2.54			0.100	

Materials	
Solder Pad Termination	Au plating 30 - 60 ulnches (76.2-152 uM) over 80-200 ulnches (203-508 uM) Ni.
Lid	Fe-Ni-Co Alloy Electroless Nickel Plate (8-11% Phosphorus) 100-200 ulnches Thick
Body	Al <sub>2</sub> O <sub>3</sub> Ceramic
Pb Free	

Electrical Connections		
Connection		Terminals
Port 1	Input or Return	2
	Return or Input	3
Port 2	Output or Return	8
	Return or Output	9
Ground		All others
Single Ended Operation		Return is ground
Differential Operation		Return is hot



REV	ECN NO.	DES
A	1192-21	INITIAL RELEASE
B	4611	FIXTURE UPDA
C	10225	REVISED PIN

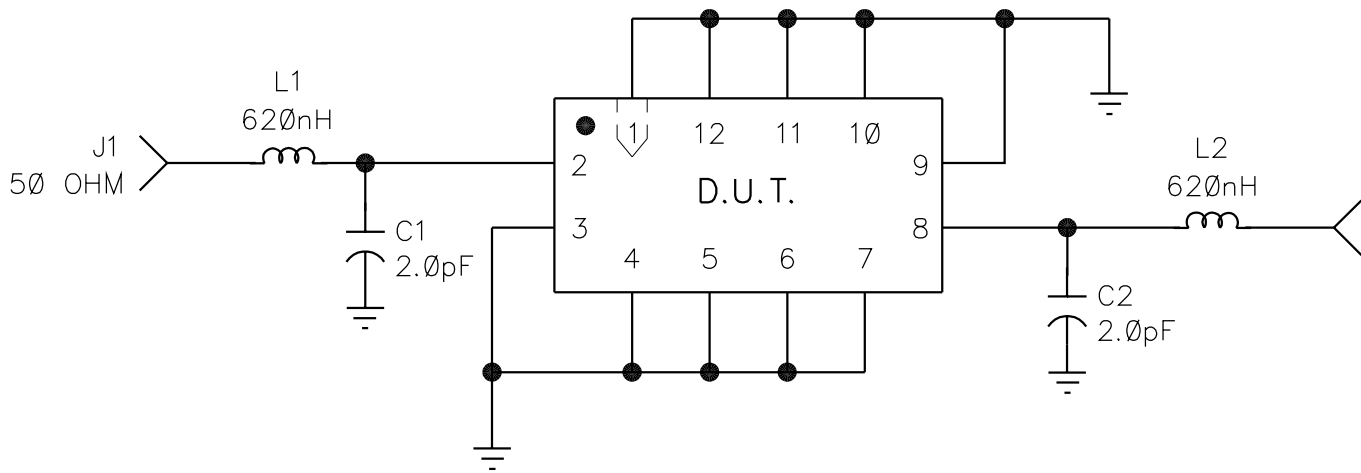
BILL OF MATERIALS

SEQ	QTY	RFM P/N	DESCRIPTION	REF DES	REFEREN COMMENT
1	1	400-0735-001	PCB (REV:X3)	PCB	
2	2	500-0003-020	CAP, NPO 2.0 pF	C1,2	±.25p
3	2	N/A	CHIP INDUCTOR 620 nH	L1,2	±10%, Coilcraft#: 1000
4	2	500-0248-001	CONN, COAX, FLANGE MT. JACK	J1,2	
5	1	400-0533-001	SHIELD, BRASS	SHLD1	

DRAWN BY/DATE: D. GAY 04/26/94

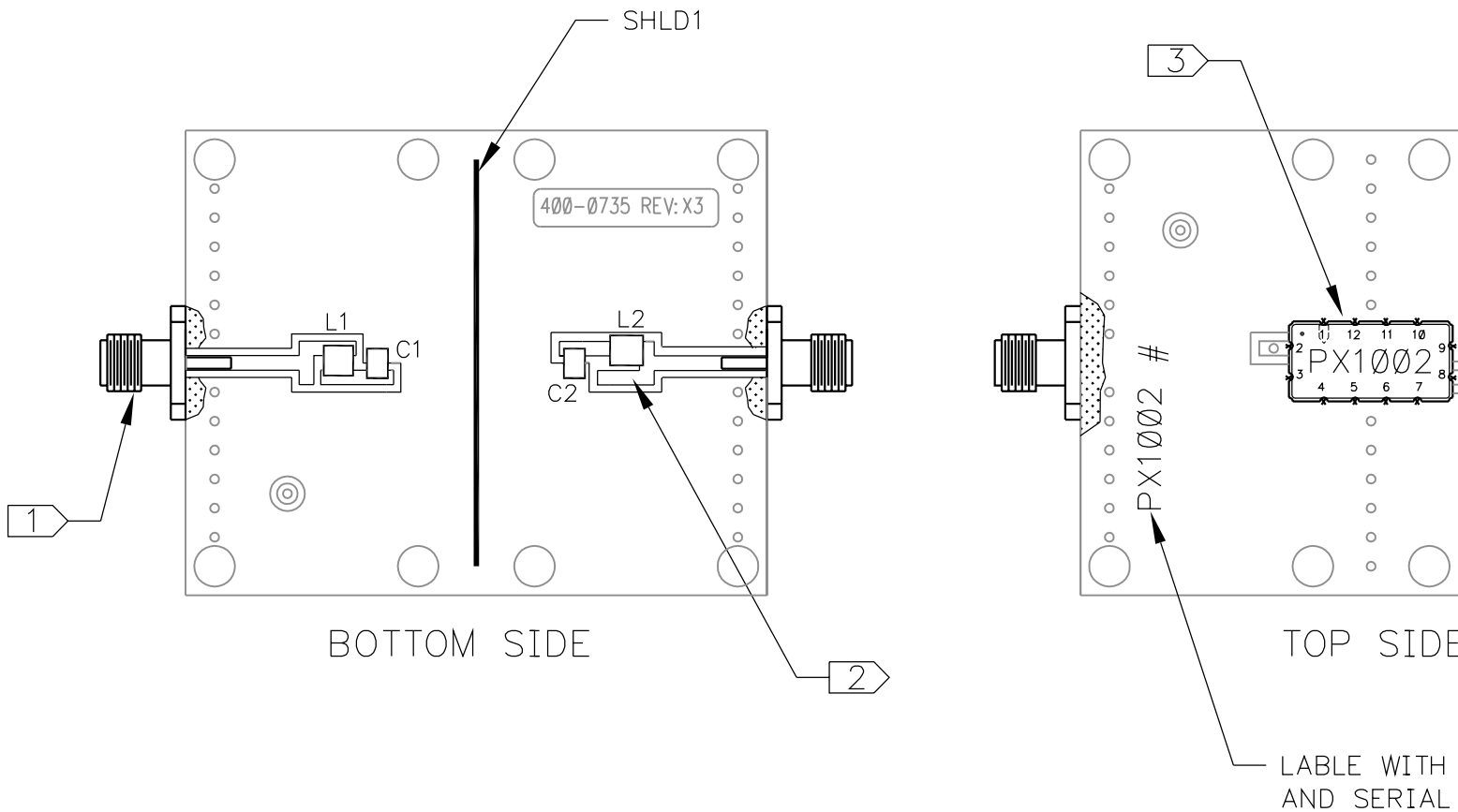
TITLE: DEMO PCB,

SCHEMATIC, PX1002 (DEMO)



NOTES:

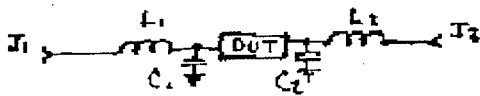
1. SOLDER CONNECTORS, J1 & J2, TO PCB. SOLDER ON TOP AND BOTTOM SIDE OF PCB AS SHOWN.
2. NOTE PROPER ORIENTATION OF INDUCTORS L1 AND L2. INDUCTORS SHOULD BE POSITIONED AT 90° TO EACH OTHER.
3. SOLDER SURFACE MOUNT PACKAGE, PX1002, TO TOP SIDE OF PCB. SOLDER AT 12 PLACES MARKED "X" AS SHOWN.



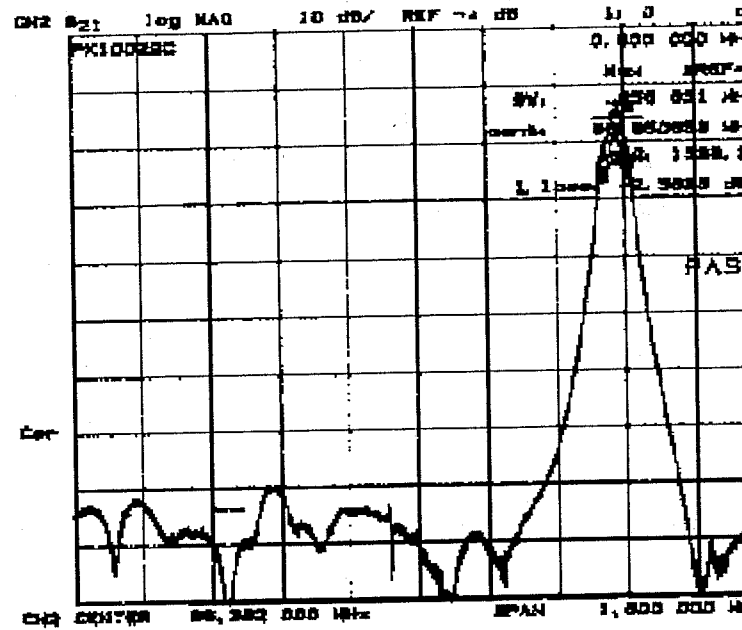
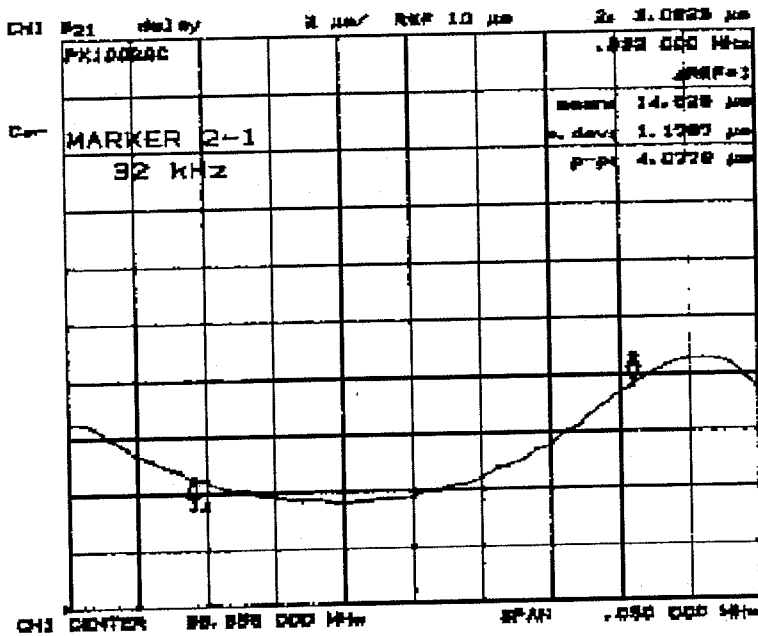
## TUNING:

PLOT A SHOWS TYPICAL TUNING RESPONSE S21 AND SMITH CHART. A KIT OF COMPONENTS TO BE DELIVERED WITH EACH DEMO. THE TUNING COMPONENTS MAY VARY IN ORDER TO ACHIEVE PROPER TUNING DUE TO COMPONENT TOLERANCES. NOTE COMPONENT VALUES AND TOLERANCES ON PLOT.





PX1002, Plot A Rev C



CH2 F22 1 U FB 1x 80.588  $\mu$ s 2.975  $\mu$ s 7.0075  $\mu$ s

PX1002BC

MARKER 1  
86.65 MHz

ECN NO

CH2 CENTER 86.582 000 MHz

CH2 F22 1 U FB 1x 80.588  $\mu$ s -2.8800  $\mu$ s 200.00

PX1002BC

MARKER 1  
86.65 MHz

CH2 CENTER 86.582 000 MHz

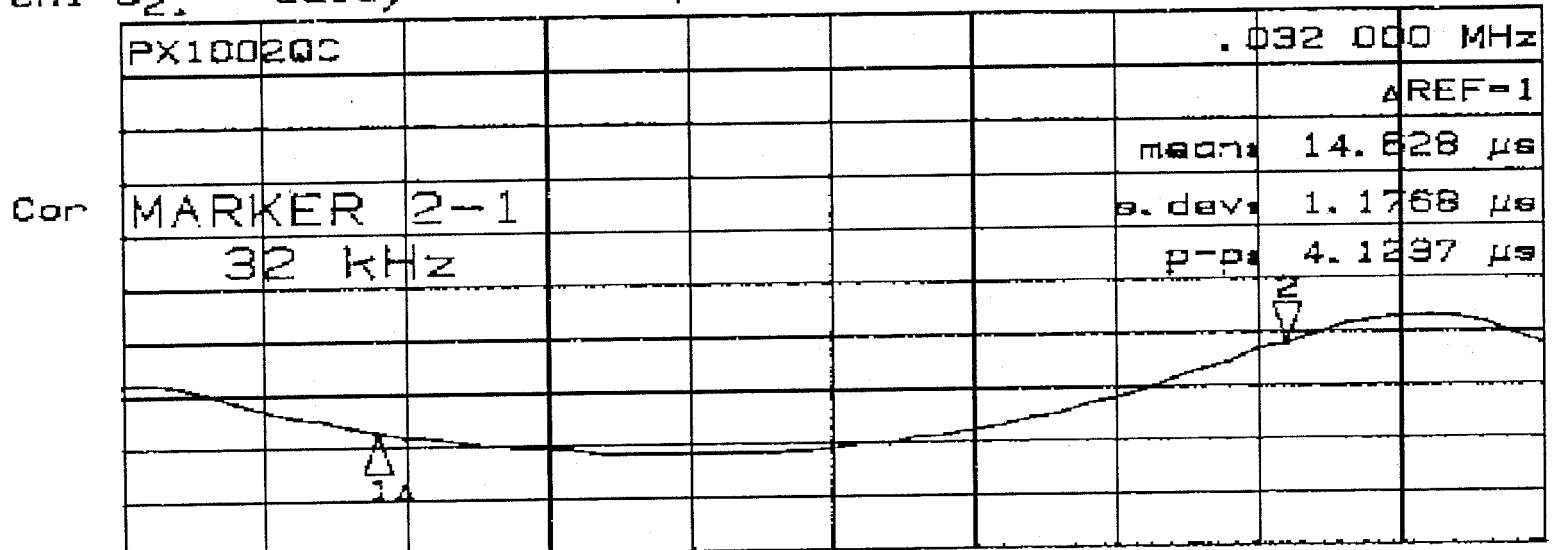
SHEET

10 225

8

PX1002, Plot B

CH1 S2: delay 2  $\mu$ s/ REF 10  $\mu$ s 2: 3.1204  $\mu$ s



CH1 CENTER 86.856 000 MHz SPAN .050 000 MHz  
 CH2 S2: log MAG 10 dB/ REF -4 dB 1 0 dB

