

# SAW Components

Data Sheet M 3951 M





SAW Components	M 3951 M
IF Filter for Video Applications	45,75 MHz

## Standard

M/N

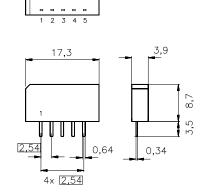
#### Features

- TV IF filter with Nyquist slope and sound suppression
- Customized group delay predistortion
- Suitable for FCC EIA / IS-31

#### Terminals

Tinned CuFe alloy

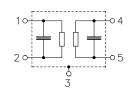
# Plastic package SIP5K



Dimensions in mm, approx. weight 1,0 g

#### **Pin configuration**

- 1 Input
- 2 Input ground
- 3 Chip carrier ground
- 4 Output
- 5 Output



Туре	Ordering code	Marking and package according to	Packing according to
M 3951 M	B39458-M3951-M100	C61157-A1-A15	F61074-V8067-Z000

## **Maximum ratings**

Operable temperature range	T <sub>A</sub>	-25/+65	°C	
Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	5	V	between any terminals
AC voltage	$V_{\rm pp}$	10	V	between any terminals

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Terminating source impedance: $Z_s^2 = 50 \Omega$ Terminating load impedance: $Z_L^2 = 2 k\Omega \  3 pF$ Insertion attenuation $\alpha$ Reference level for the       44,06 (44,00) MHz       10,5       12,0       13,5       dB         Relative attenuation $\alpha_{rel}$ 10,5       12,0       13,5       dB         Relative attenuation $\alpha_{rel}$ 4,9       5,9       6,9       dB         Color carrier       42,23 (42,17) MHz       1,2       2,2       3,2,2       dB         Sound carrier       41,31 (41,25) MHz       25,0       32,0       -       dB         Adjacent picture carrier       39,81 (39,75) MHz       48,0       61,0       -       dB         Lower sidelobe       35,0639,81 (35,0039,75) MHz       38,0       42,0       -       dB         Reflected wave signal suppression       42,0       52,0       -       dB         1,1 µs 6,0 µs after main pulse       50,0       56,0       -       dB         Reflected wave signal suppression       42,0       52,0       -       dB         1,2 µs 1,1 µs before main pulse       50,0       56,0       -       dB         (reference frequency 44,06 MHz) <th>SAW Components</th> <th></th> <th></th> <th></th> <th></th> <th>M</th> <th>3951 M</th>	SAW Components					M	3951 M
Characteristics           T <sub>A</sub> = 25 (45) °C           Terminating source impedance:         Z <sub>S</sub> = 50 Ω           Terminating load impedance:         Z <sub>L</sub> = 2 kΩ    3 pF           Image: Source impedance:         Z <sub>L</sub> = 2 kΩ    3 pF           Image: Source impedance:         Z <sub>L</sub> = 2 kΩ    3 pF           Image: Source impedance:         Z <sub>L</sub> = 2 kΩ    3 pF           Image: Source impedance:         Z <sub>L</sub> = 2 kΩ    3 pF           Image: Source impedance:         Z <sub>L</sub> = 2 kΩ    3 pF           Image: Source impedance:         Z <sub>L</sub> = 2 kΩ    3 pF           Image: Source impedance:         Z <sub>L</sub> = 2 kΩ    3 pF           Image: Source impedance:         Z <sub>L</sub> = 2 kΩ    3 pF           Image: Source impedance:         Z <sub>L</sub> = 2 kΩ    3 pF           Image: Source impedance:         Areit           Optimize impedance:         Z <sub>L</sub> = 2 kΩ    3 pF           Source arrier 45,81 (45,75) MHz         4,9         5,9         6,9         dB           Source arrier 41,31 (41,25) MHz         1,2         2,2 <th colspan="3">IF Filter for Video Applications</th> <th></th> <th></th> <th>45,7</th> <th>75 MHz</th>	IF Filter for Video Applications					45,7	75 MHz
Reference temperature: $T_A = 25 (45)$ °C         Terminating source impedance: $Z_S = 50 \Omega$ Terminating load impedance: $Z_L = 2 k\Omega \parallel 3 pF$ Insertion attenuation $\alpha$ Reference level for the       44,06 (44,00) MHz       10,5       12,0       13,5       dB         Relative attenuation $\alpha$ $\alpha$ 10,5       12,0       13,5       dB         Color carrier       45,81 (45,75) MHz       4,9       5,9       6,9       dB         Color carrier       41,31 (41,25) MHz       25,0       32,0       —       dB         Adjacent picture carrier       39,81 (39,75) MHz       48,0       61,0       —       dB         Adjacent sound carrier       47,31 (47,25) MHz       38,0       42,0       —       dB         Lower sidelobe       35,0639,81 (35,0039,75) MHz       38,0       42,0       —       dB         Reference level signal suppression       1,1 µs6,0 µs after main pulse       50,0       56,0       —       dB         Reference frequency 44,06 MHz) $\Delta \tau$ — $-10$ —       ms         Group delay predistortion $\Delta \tau$ — $-10$ —       ns	Data Sheet						
Terminating source impedance: $Z_6^2 = 50 \Omega$ Terminating load impedance: $Z_L^2 = 2 k\Omega    3 pF$ Insertion attenuation $\alpha$ Reference level for the       44,06 (44,00) MHz       10,5       12,0       13,5       dB         Relative attenuation $\alpha$ 10,5       12,0       13,5       dB         Picture carrier       45,81 (45,75) MHz       4,9       5,9       6,9       dB         Color carrier       42,23 (42,17) MHz       1,2       2,2       3,2       dB         Adjacent picture carrier       39,81 (39,75) MHz       48,0       61,0       —       dB         Adjacent picture carrier       39,81 (35,0039,75) MHz       48,0       56,0       —       dB         Lower sidelobe       35,0639,81 (35,0039,75) MHz       38,0       42,0       —       dB         Reflected wave signal suppression       42,0       52,0       —       dB         1,1 µs 6,0 µs after main pulse       50,0       56,0       —       dB         Reflected wave signal suppression       42,0       52,0       —       dB         1,2 µs 1,1 µs before main pulse       50,0       56,0       —       dB         Group delay predist	Characteristics						
Insertion attenuation         α         π         π           Reference level for the following data         44,06 (44,00) MHz         10,5         12,0         13,5         dB           Reference level for the following data         44,06 (44,00) MHz         10,5         12,0         13,5         dB           Relative attenuation $\alpha_{rel}$ 4,9         5,9         6,9         dB           Color carrier         42,23 (42,17) MHz         1,2         2,2         3,2         dB           Adjacent picture carrier         39,81 (39,75) MHz         48,0         61,0         -         dB           Adjacent picture carrier         39,81 (39,75) MHz         48,0         56,0         -         dB           Lower sidelobe         35,0639,81 (35,0039,75) MHz         38,0         42,0         -         dB           Lower sidelobe         47,3155,06 (47,2555,00) MHz         36,0         41,0         -         dB           Reflected wave signal suppression         1,1 μs before main pulse         42,0         52,0         -         dB           (test pulse 250 ns, carrier frequency 44,06 MHz)         50,0         56,0         -         dB           Group delay predistortion (reference frequency: 45,81 MHz)         -		ance: Z <sub>S</sub>	= 50 Ω				
Reference level for the d4,06 (44,00) MHz       10,5       12,0       13,5       dB         Relative attenuation $\alpha_{rel}$ 4,9       5,9       6,9       dB         Picture carrier       42,23 (42,17) MHz       1,2       2,2       3,2       dB         Adjacent picture carrier       41,31 (41,25) MHz       25,0       32,0       —       dB         Adjacent picture carrier       47,31 (47,25) MHz       48,0       61,0       —       dB         Adjacent sound carrier       47,31 (47,25) MHz       38,0       42,0       —       dB         Sound carrier       47,31 (47,25) MHz       38,0       42,0       —       dB         Upper sidelobe       47,3155,06 (47,2555,00) MHz       36,0       41,0       —       dB         Vest use 250 ns, carrier frequency 44,06 MHz)       50,0       56,0       —       dB         Feedthrough signal suppression         1,2 µs 1,1 µs before main pulse (test pulse 250 ns, carrier frequency 44,06 MHz) $\Delta \tau$ —       —       dB         Group delay predistortion (reference frequency: 45,81 MHz) $\Delta \tau$ —       —       —       ns $42,23 (42,17)$ MHz $ -10$ —       ns				min.	typ.	max.	
following data	Insertion attenuation		α				
Picture carrier       45,81 (45,75) MHz       4,9       5,9       6,9       dB         Color carrier       42,23 (42,17) MHz       1,2       2,2       3,2       dB         Sound carrier       41,31 (41,25) MHz       25,0       32,0        dB         Adjacent picture carrier       39,81 (39,75) MHz       48,0       61,0        dB         Adjacent sound carrier       47,31 (47,25) MHz       46,0       56,0        dB         Lower sidelobe	Reference level for the following data	44,06 (44,00) MH	Z	10,5	12,0	13,5	dB
Picture carrier       45,81 (45,75) MHz       4,9       5,9       6,9       dB         Color carrier       42,23 (42,17) MHz       1,2       2,2       3,2       dB         Sound carrier       41,31 (41,25) MHz       25,0       32,0        dB         Adjacent picture carrier       39,81 (39,75) MHz       48,0       61,0        dB         Adjacent sound carrier       47,31 (47,25) MHz       46,0       56,0        dB         Lower sidelobe	Relative attenuation		$\alpha_{rel}$				
Sound carrier 41,31 (41,25) MHz 25,0 32,0 — dB Adjacent picture carrier 39,81 (39,75) MHz 48,0 61,0 — dB Adjacent sound carrier 47,31 (47,25) MHz 46,0 56,0 — dB Lower sidelobe 35,0639,81 (35,0039,75) MHz 38,0 42,0 — dB Upper sidelobe 47,3155,06 (47,2555,00) MHz 36,0 41,0 — dB <b>Reflected wave signal suppression</b> 1,1 µs 6,0 µs after main pulse (42,0 52,0 — dB (test pulse 250 ns, carrier frequency 44,06 MHz) <b>Feedthrough signal suppression</b> 1,2 µs 1,1 µs before main pulse 50,0 56,0 — dB <b>Group delay predistortion</b> $\Delta \tau$ (reference frequency: 45,81 MHz) 42,23 (42,17) MHz $-$ 10 — ns <b>Group delay ripple</b> (p-p) $\Delta \tau$ — 40 — ns <b>Impedance at</b> 44,06 MHz    $C_{IN}$ — 1,4    10,8 — $K\Omega    pF$	Picture carrier	45,81 (45,75) MHz		4,9	5,9	6,9	dB
Adjacent picture carrier       39,81 (39,75) MHz       48,0       61,0        dB         Adjacent sound carrier       47,31 (47,25) MHz       46,0       56,0        dB         Lower sidelobe       35,06 39,81 (35,00 39,75) MHz       38,0       42,0        dB         Upper sidelobe       47,31 55,06 (47,25 55,00) MHz       36,0       41,0        dB         Reflected wave signal suppression       1,1 µs 6,0 µs after main pulse       42,0       52,0        dB         (test pulse 250 ns, carrier frequency 44,06 MHz)       50,0       56,0        dB         Feedthrough signal suppression       50,0       56,0        dB         1,2 µs 1,1 µs before main pulse       50,0       56,0        dB         (test pulse 250 ns, carrier frequency 44,06 MHz)        -10        ns         Group delay predistortion $\Delta \tau$ -10        ns         (reference frequency: 45,81 MHz)        -40        ns         Group delay ripple (p-p) $\Delta \tau$ -       40        ns         Impedance at 44,06 MHz       Input: $Z_{IN} = R_{IN} \parallel C_{$	Color carrier	42,23 (42,17) MH	z	1,2	2,2	3,2	dB
Adjacent sound carrier47,31 (47,25) MHz46,056,0dBLower sidelobe35,06 39,81 (35,00 39,75) MHz38,042,0dBUpper sidelobe47,31 55,06 (47,25 55,00) MHz36,041,0dBReflected wave signal suppression42,052,0dB1,1 µs 6,0 µs after main pulse42,052,0dB(test pulse 250 ns, carrier frequency 44,06 MHz)50,056,0dBFeedthrough signal suppression 1,2 µs 1,1 µs before main pulse (test pulse 250 ns, carrier frequency 44,06 MHz)50,056,0dBGroup delay predistortion 42,23 (42,17) MHz $\Delta \tau$ 10nsGroup delay ripple (p-p) $\Delta \tau$ 40nsImpedance at 44,06 MHz Lnput: $Z_{IN} = R_{IN} \parallel C_{IN}$ 1,4 \parallel 10,8 $k\Omega \parallel pF$	Sound carrier	41,31 (41,25) MH	z	25,0	32,0	_	dB
Lower sidelobe 35,0639,81 (35,0039,75) MHz Upper sidelobe 47,3155,06 (47,2555,00) MHz 36,0 41,0 41,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 52,0 42,0 50,0 56,0 42,0 50,0 56,0 42,0 50,0 56,0 43,0 42,0 50,0 56,0 48 42,0 50,0 56,0 48 50,0 50,0 56,0 56,0 56,0 56,0 56,0 56,0 56,0 56,0 50,0 56,0 56,0 50,0 56,0 56,0 50,0 50	Adjacent picture carrier	39,81 (39,75) MH	z	48,0	61,0	_	dB
Upper sidelobe $47,3155,06$ ( $47,2555,00$ ) MHz $36,0$ $41,0$ $-$ dB         Reflected wave signal suppression $1,1 \ \mu s \dots 6,0 \ \mu s$ after main pulse $42,0$ $52,0$ $-$ dB         Item (test pulse 250 ns, carrier frequency 44,06 MHz) $42,0$ $52,0$ $-$ dB         Feedthrough signal suppression $50,0$ $56,0$ $-$ dB         Item (test pulse 250 ns, carrier frequency 44,06 MHz) $50,0$ $56,0$ $-$ dB         Group delay predistortion $\Delta \tau$ $-10$ $-$ ns         (reference frequency: 45,81 MHz) $-233$ ( $42,17$ ) MHz $ -10$ $-$ ns         Group delay ripple (p-p) $\Delta \tau$ $ 40$ $-$ ns         Impedance at 44,06 MHz $L_{\rm Input:< Z_{\rm IN} = R_{\rm IN} \parallel C_{\rm IN}$ $ 1,4 \parallel 10,8$ $ k\Omega \parallel pF$	Adjacent sound carrier Lower sidelobe	47,31 (47,25) MH	Z	46,0	56,0	—	dB
47,31 55,06 (47,25 55,00) MHz       36,0       41,0       —       dB         Reflected wave signal suppression       42,0       52,0       —       dB         1,1 µs 6,0 µs after main pulse (test pulse 250 ns, carrier frequency 44,06 MHz)       42,0       52,0       —       dB         Feedthrough signal suppression       50,0       56,0       —       dB         1,2 µs 1,1 µs before main pulse (test pulse 250 ns, carrier frequency 44,06 MHz)       50,0       56,0       —       dB         Group delay predistortion (reference frequency: 45,81 MHz) $\Delta \tau$ —       -10       —       ns         42,23 (42,17) MHz       —       -40       —       ns       ns         Group delay ripple (p-p) $\Delta \tau$ —       40       —       ns         Inpedance at 44,06 MHz       Input: $Z_{IN} = R_{IN} \parallel C_{IN}$ —       1,4 \parallel 10,8       —       k $\Omega \parallel pF$	35,06 39,81	(35,00 39,75) MHz	z	38,0	42,0	_	dB
Reflected wave signal suppression 1,1 µs 6,0 µs after main pulse (test pulse 250 ns, carrier frequency 44,06 MHz)42,052,0—dBFeedthrough signal suppression 1,2 µs 1,1 µs before main pulse (test pulse 250 ns, carrier frequency 44,06 MHz)50,056,0—dBGroup delay predistortion (reference frequency: 45,81 MHz) 42,23 (42,17) MHz $\Delta \tau$ 50,056,0—dBGroup delay ripple (p-p) $\Delta \tau$ —-10—nsGroup delay ripple (p-p) $\Delta \tau$ —40—nsImpedance at 44,06 MHz $Input: Z_{IN} = R_{IN} \parallel C_{IN}$ —1,4 \parallel 10,8—k $\Omega \parallel pF$	Upper sidelobe						
1,1 $\mu$ s 6,0 $\mu$ s after main pulse42,052,0—dB(test pulse 250 ns, carrier frequency 44,06 MHz)50,056,0—dBFeedthrough signal suppression 1,2 $\mu$ s 1,1 $\mu$ s before main pulse (test pulse 250 ns, carrier frequency 44,06 MHz)50,056,0—dBGroup delay predistortion 42,81 (42,75) MHz 42,81 (42,75) MHz 42,23 (42,17) MHz———10—nsGroup delay ripple (p-p) $\Delta \tau$ —40—nsImpedance at 44,06 MHz Input: $Z_{IN} = R_{IN} \parallel C_{IN}$ —1,4 \parallel 10,8— $k\Omega \parallel pF$	47,31 55,06	(47,2555,00) MH2	<u>z</u>	36,0	41,0	—	dB
1,1 $\mu$ s 6,0 $\mu$ s after main pulse42,052,0—dB(test pulse 250 ns, carrier frequency 44,06 MHz)50,056,0—dBFeedthrough signal suppression 1,2 $\mu$ s 1,1 $\mu$ s before main pulse (test pulse 250 ns, carrier frequency 44,06 MHz)50,056,0—dBGroup delay predistortion 42,81 (42,75) MHz 42,81 (42,75) MHz 42,23 (42,17) MHz———10—nsGroup delay ripple (p-p) $\Delta \tau$ —40—nsImpedance at 44,06 MHz Input: $Z_{IN} = R_{IN} \parallel C_{IN}$ —1,4 \parallel 10,8— $k\Omega \parallel pF$	Reflected wave signal su	ppression					
carrier frequency 44,06 MHz)Feedthrough signal suppression 1,2 $\mu$ s 1,1 $\mu$ s before main pulse (test pulse 250 ns, carrier frequency 44,06 MHz)50,056,0—dBGroup delay predistortion (reference frequency: 45,81 MHz) 42,81 (42,75) MHz 42,23 (42,17) MHz $ -10$ $-$ ms nsGroup delay ripple (p-p) $\Delta \tau$ —40—ns nsImpedance at 44,06 MHz $lnput: Z_{IN} = R_{IN} \parallel C_{IN}$ — $ 1,4 \parallel 10,8$ — $k\Omega \parallel pF$	1,1 μs 6,0 μs after main	pulse		42,0	52,0	_	dB
Feedthrough signal suppression 1,2 µs 1,1 µs before main pulse (test pulse 250 ns, carrier frequency 44,06 MHz)50,056,0—dBGroup delay predistortion (reference frequency: 45,81 MHz) 42,81 (42,75) MHz 42,23 (42,17) MHz $\Delta \tau$ -—-10 -—nsGroup delay ripple (p-p) $\Delta \tau$ —-40—nsImpedance at 44,06 MHz lnput: $Z_{IN} = R_{IN} \parallel C_{IN}$ —1,4 \parallel 10,8—k $\Omega \parallel pF$	(test pulse 250 ns,						
1,2 $\mu$ s 1,1 $\mu$ s before main pulse (test pulse 250 ns, carrier frequency 44,06 MHz)50,056,0—dBGroup delay predistortion (reference frequency: 45,81 MHz) 42,81 (42,75) MHz 42,23 (42,17) MHz $\Delta \tau$ -—-10 -—ns nsGroup delay ripple (p-p) $\Delta \tau$ —-40—ns nsImpedance at 44,06 MHz lnput: $Z_{IN} = R_{IN} \parallel C_{IN}$ —1,4 \parallel 10,8—k $\Omega \parallel pF$		Hz)					
1,2 $\mu$ s 1,1 $\mu$ s before main pulse (test pulse 250 ns, carrier frequency 44,06 MHz)50,056,0—dBGroup delay predistortion (reference frequency: 45,81 MHz) 42,81 (42,75) MHz 42,23 (42,17) MHz $\Delta \tau$ -—-10 -—nsGroup delay ripple (p-p) $\Delta \tau$ —-40—nsImpedance at 44,06 MHz lnput: $Z_{IN} = R_{IN} \parallel C_{IN}$ —1,4 \parallel 10,8— $k\Omega \parallel pF$	Feedthrough signal supr	pression					
(test pulse 250 ns, carrier frequency 44,06 MHz) $\Delta \tau$ $\Delta \tau$ Group delay predistortion (reference frequency: 45,81 MHz) 42,81 (42,75) MHz $ -10$ $ 42,81 (42,75) MHz$ 42,23 (42,17) MHz $ -10$ $-$ nsGroup delay ripple (p-p) $\Delta \tau$ $ 40$ $-$ nsImpedance at 44,06 MHz Input: $Z_{IN} = R_{IN} \parallel C_{IN}$ $ 1,4 \parallel 10,8$ $ k\Omega \parallel pF$				50,0	56,0	_	dB
carrier frequency 44,06 MHz) $\Delta \tau$ $\Delta \tau$ Group delay predistortion (reference frequency: 45,81 MHz) $\Delta \tau$ $-$ 42,81 (42,75) MHz 42,23 (42,17) MHz $ -10$ $ -$ Group delay ripple (p-p) $\Delta \tau$ $ -40$ $-$ Impedance at 44,06 MHz Input: $Z_{IN} = R_{IN} \parallel C_{IN}$ $ 1,4 \parallel 10,8$ $ k\Omega \parallel pF$		•					
(reference frequency: 45,81 MHz) $42,81 (42,75) \text{ MHz}$ $ -10$ $-$ ns $42,81 (42,75) \text{ MHz}$ $ -40$ $-$ ns         Group delay ripple (p-p) $\Delta \tau$ $ 40$ $-$ ns         Impedance at 44,06 MHz       Input: $Z_{IN} = R_{IN} \parallel C_{IN}$ $ 1,4 \parallel 10,8$ $ k\Omega \parallel pF$		Hz)					
(reference frequency: 45,81 MHz) $42,81 (42,75) \text{ MHz}$ $ -10$ $-$ ns $42,81 (42,75) \text{ MHz}$ $ -40$ $-$ ns         Group delay ripple (p-p) $\Delta \tau$ $ 40$ $-$ ns         Impedance at 44,06 MHz       Input: $Z_{IN} = R_{IN} \parallel C_{IN}$ $ 1,4 \parallel 10,8$ $ k\Omega \parallel pF$	Group delay predistortio	n	Δτ				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$							
42,23 (42,17) MHz        -40        ns         Group delay ripple (p-p) $\Delta \tau$ 40        ns         Impedance at 44,06 MHz       Input: $Z_{IN} = R_{IN} \parallel C_{IN}$ 1,4 \parallel 10,8        k $\Omega \parallel pF$			Z	_	-10	_	ns
Impedance at 44,06 MHz Input: $Z_{IN} = R_{IN}    C_{IN} - 1,4    10,8 - k\Omega    pF$				_	-40	—	ns
Input: $Z_{IN} = R_{IN}    C_{IN}$ — 1,4    10,8 — $k\Omega    pF$	Group delay ripple (p-p)		$\Delta \tau$	_	40	_	ns
	Impedance at 44,06 MHz						
	Input: Z	$Z_{\rm IN} = R_{\rm IN}    C_{\rm IN}$		_	1,4    10,8	—	kΩ    pF
	Output: Z	$Z_{\text{OUT}} = R_{\text{OUT}} \parallel C_{\text{OUT}}$		_	0,9    4,4	—	kΩ    pF

3 Mar 31, 2006

 $TC_{\rm f}$ 

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-72

ppm/K

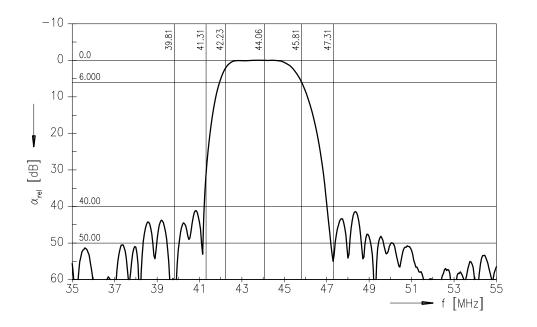
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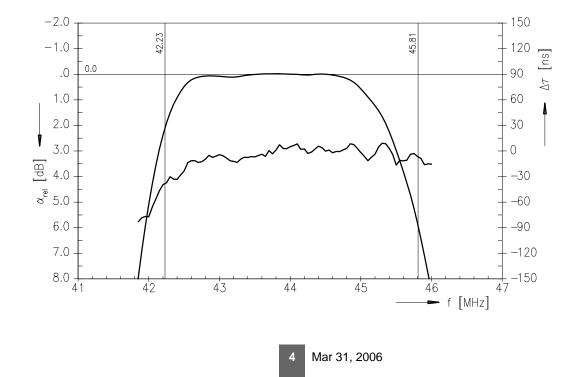
Temperature coefficient of frequency



SAW Components	M 3951 M
IF Filter for Video Applications	45,75 MHz

# **Frequency response**

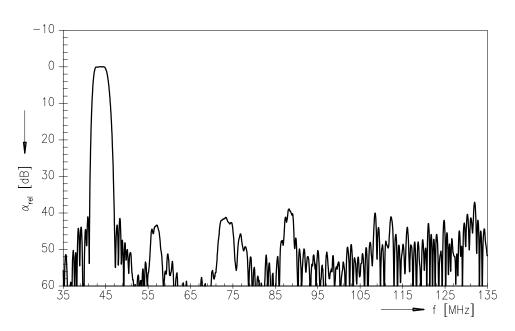




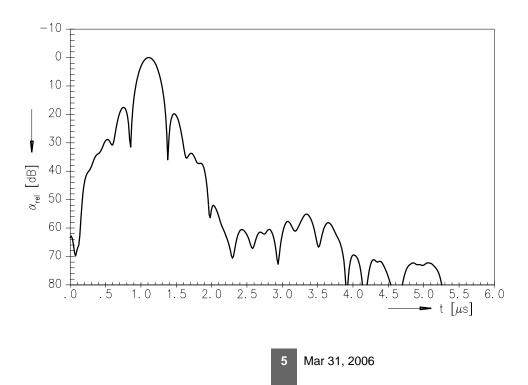


SAW Components	M 3951 M
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# **Frequency response**



Time domain response





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