



# CML Semiconductor Products

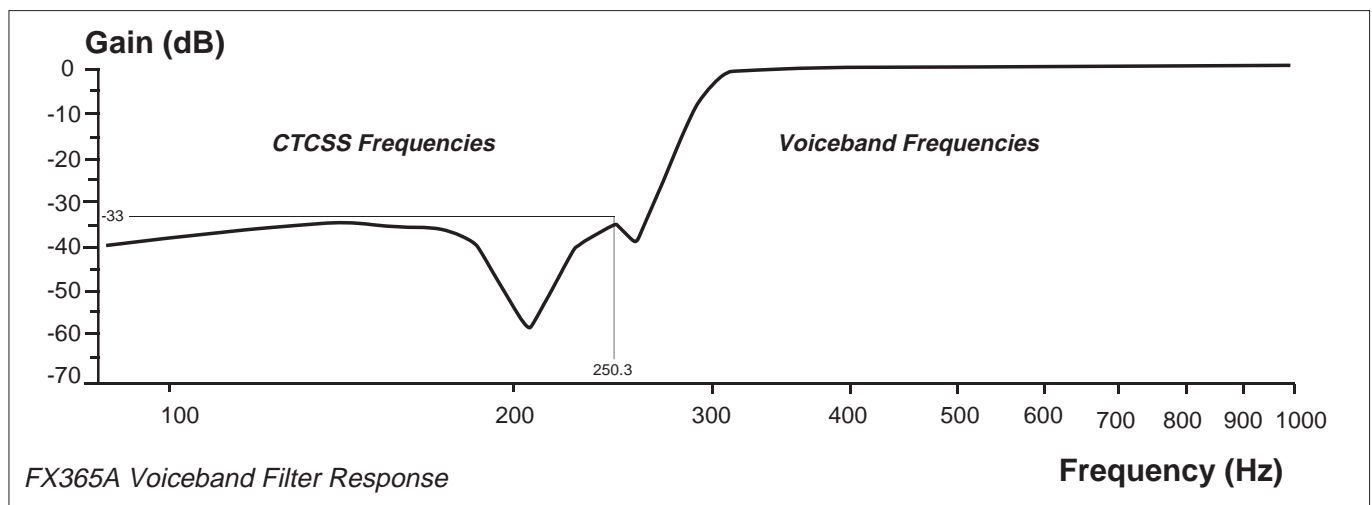
PRODUCT INFORMATION

## FX365A CTCSS Encoder/Decoder

Publication No. D/365A/F/2 Feb 1992  
Advance Information

### Features

- Improved Audio and Noise Performance
- 39 Programmable Sub-Audio Tones + NOTONE
- Sub-Audio Frequency Range 67.0Hz to 250.3Hz
- Reduced Current Requirement in Rx Monitoring Mode
- Pin and Function Compatible with FX365 Microcircuits
- High Voiceband/CTCSS Isolation



### Brief Description

The FX365A is a half-duplex  $\mu$ Processor controlled CTCSS Encoder and Decoder with integral voice-band filtering.

This device which is pin and function compatible with standard FX365 microcircuits is also available in a 24pin plastic Small Outline (S.O.I.C.) [365A DW] SMD package. The FX365A demonstrates improved voice-band noise performance and requires less supply current in the Rx monitoring mode.

The FX365A has the capability of encoding and decoding 39 separate sub-audio tones, 38 of which are detailed in the current FX365 Data Sheet, plus an additional tone of 69.3Hz.

This Data Sheet, which details the differences between the **FX365A** and the FX365 microcircuits, should be used with the current **FX365** Data Sheet.

### Programmable Sub-Audio Rx and Tx Frequencies (Hz)

67.0	<b>69.3</b>	71.9	74.4	77.0	79.7	82.5	85.4
88.5	91.5	94.8	97.4	100.0	103.5	107.2	110.9
114.8	118.8	123.0	127.3	131.8	136.5	141.3	146.2
151.4	156.7	162.2	167.9	173.8	179.9	186.2	192.8
203.5	210.7	218.1	225.7	233.6	241.8	250.3	NOTONE

FX365A Tx and Rx Sub-Audio Frequencies

### 69.3Hz Tone Generation

The additional sub-audio tone provided by the FX365A is 69.3Hz.

With reference to the FX365 Data Sheet – Table 3, the programming information is as follows:

Nominal Freq. (Hz)	D <sub>0</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>
69.3	1	0	0	1	1	1

# Specification

## Absolute Maximum Ratings

Exceeding the maximum rating can result in device damage. Operation of the device outside the operating limits is not implied.

Supply voltage		-0.3 to 7.0V
Input voltage at any pin (ref $V_{SS} = 0V$ )		-0.3 to ( $V_{DD} + 0.3V$ )
Sink/source current (supply pins)		+/- 30mA
(other pins)		+/- 20mA
Total device dissipation @ $T_{AMB} 25^{\circ}C$		800mW Max.
Derating		10mW/ $^{\circ}C$
Operating temperature range:	<b>FX365A J</b>	-40 $^{\circ}C$ to +85 $^{\circ}C$ (cerdip)
	<b>FX365A DW/LG/LS</b>	-40 $^{\circ}C$ to +85 $^{\circ}C$ (plastic)
Storage temperature range:	<b>FX365A J</b>	-55 $^{\circ}C$ to +125 $^{\circ}C$ (cerdip)
	<b>FX365A DW/LG/LS</b>	-40 $^{\circ}C$ to +85 $^{\circ}C$ (plastic)

## Operating Limits

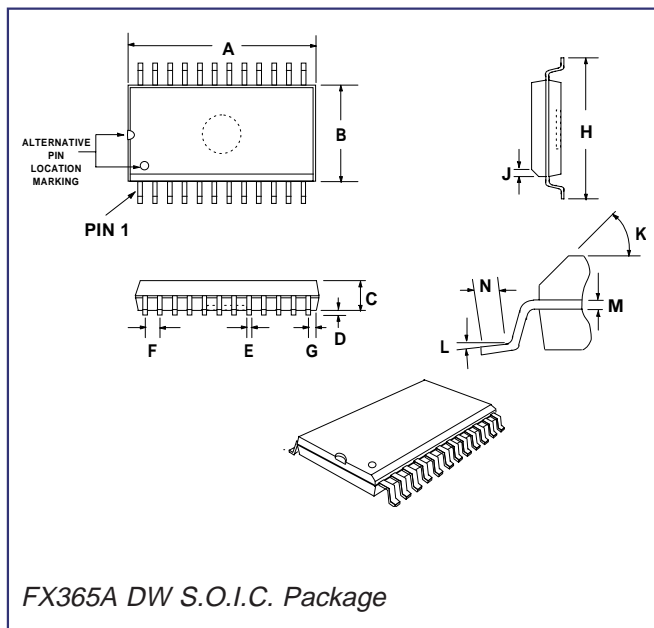
All device characteristics are measured under the following conditions unless otherwise specified:

$V_{DD} = 5.0V$ .  $T_{AMB} = 25^{\circ}C$ . Xtal/Clock  $f_0 = 1.0MHz$ . Audio level 0dB ref: = 300mV rms

Composite Signal Content = 1.0kHz tone at 0dB, Noise at -12dB (gaussian white noise band-limited to 6.0kHz), Programmed CTCSS tone at -20dB.

Characteristics	See Note	Min.	Typ.	Max.	Unit
<b>Static Values</b>					
Supply Voltage		4.5	5.0	5.5	V
Supply Current (Tx)		-	3.5	-	mA
(Rx)		-	3.5	-	mA
(Rx Monitor)	1	-	2.5	-	mA
<b>Audio Filter</b>					
Passband Frequencies		300		3000	Hz
Passband Gain at 1.0kHz		-	0	-	dB
w.r.t. 1.0kHz		-2.0	-	0.5	dB
Stopband Frequencies		-	-	250	Hz
Attenuation		33.0	36.0	-	dB
Output Noise (a.c. short circuit)	2	-	-54.0	-48.0	dB
SINAD	3	36.0	40.0	-	dB
Tx Output Impedance		-	2.0	-	$k\Omega$
Tx Output Amplitude		-	950	-	mVrms
Spurious Emissions		-	-	-48.0	dB

- Notes**
- 1 See FX365 Data Sheet Table 2.
  2. Measured in a 30kHz bandwidth.
  3. With an input level of 308mVrms at 1.0kHz, in a 30kHz bandwidth.



## Ordering Information

<b>FX365A DW</b>	24-pin surface mount S.O.I.C.
<b>FX365A J</b>	24-pin cerdip DIL
<b>FX365A LG</b>	24-pin quad plastic encapsulated bent and cropped
<b>FX365A LS</b>	24-lead plastic leaded chip carrier

DIMENSION	MIN	TYP	MAX
A	15.16		15.60
B	7.39		7.59
C	2.21		2.67
D		0.20	
E		0.40	
F		1.27	
G		0.66	
H	10.11		10.51
J		0.63	
K		45 $^{\circ}$	
L		5 $^{\circ}$	
M		0.25	
N		0.76	

CML does not assume any responsibility for the use of any circuitry described. No circuit patent licences are implied and CML reserves the right at any time without notice to change the said circuitry.

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