CML Microcircuits

COMMUNICATION SEMICONDUCTORS

CMX469A

APPLICATION NOTE

Design Migration from MX469 to CMX469A

Migrating MX469 Designs to Use the CMX469A Device

The new CMX469A device is virtually 'socket compatible' with the MX469, its predecessor, but it provides better performance and so is preferred. In particular, the CMX469A adds support for reduced supply voltage and its Carrier Detect function has been improved to be more accurate and operate at a higher data rate. This note helps ensure successful design migration from the MX469 to the CMX469A by describing their differences.

1   Reduced Supply Voltage

The CMX469A adds support for reduced supply voltage that, when used, significantly reduces typical supply current relative to 5V operation. The related power reduction can be particularly advantageous in portable, battery powered, applications.   This CMX469A improvement over the MX469 is shown in the following table:

Characteristic	MX469			CMX469A			Units
	Min	Typ	Max	Min	Typ	Max	
Operating Limits Supply Voltage	4.5		5.5	2.7		5.5	V
Supply Current at 5V							
RX Enabled, TX Disabled		3.6			3.6		mA
RX and TX Enabled		4.5			4.5		mA
RX and TX Disabled		650			650		µA
Supply Current at 3.0V (CMX469A only)							
RX Enabled, TX Disabled					1.5		mA
RX and TX Enabled					2.0		mA
RX and TX Disabled					300		µA

2   Carrier Detect function

Carrier Detect is a digital output signal on both the MX469 and CMX469A devices. Its state indicates when a received MSK signal's carrier energy is being received.

2.1   Carrier Detect operation at 4800bps

The CMX469A Carrier Detect function supports the 4800bps data rates whereas the MX469A Carrier Detect function does not. This CMX469A enhancement eliminates the need to implement an external carrier detect function for 4800bps data rate applications and so can reduce total design costs.

2.2   Carrier Detect output timing

The CMX469A carrier detect function is more accurate than the MX469's because it includes an automatic and additional qualification test. This CMX469A qualifier function requires 2mS plus at least 8 bit periods of time, after the receiver is enabled, to stabilize the Carrier Detect output to a valid state. The same CMX469A function also causes its Carrier Detect output signal to be asserted for integer numbers of bit times whereas the MX469 does not exhibit this behavior.

2.3 Carrier Detect output state when in powersave mode

In both devices the state of the Carrier Detect output is meaningful only when a device's MSK demodulator is operating i.e. when the receiver is enabled. Receiver enabling is controlled via the RX Enable input signal (logic '1' for 'RX Enable', logic '0' for powersave). When RX Enable is set to a logic '0' (powersave mode) the Carrier Detect output states of the MX469 and CMX469A devices differ according to the following table:

RX Enable input signal state	Carrier Detect Output State	
	MX469	**CMX469A**
0 (low), Rx powersave	0 (low)	0 or 1 (indeterminate)
1 (high), Rx enabled	enabled	enabled

In general, end product designs should not rely upon the static output state of a demodulator's Carrier Detect output signal unless it is enabled. Accordingly, it is expected that few MX469-based designs, if any, will be affected by this difference when the MX469 is replaced by a CMX469A.

3 Package Styles

The CMX469A adds support for the TSSOP package style and eliminates it for the 24 pin SOIC package style. The 20 pin SOIC and 22 pin PDIP package styles continue to be supported. Note that the 24 pin SOIC is no longer supported so MX469DW designs must take this into account when migrating to the CMX469AD3 20 pin SOIC. Supported package styles and their designators are shown in the table below:

Package	MX469			CMX469A		
	supported?	designator	part #	supported?	designator	part #
22 pin PDIP	yes	P	MX469P	yes	P6	CMX469AP6
20 pin SOIC	yes	D3	MX469D3	yes	D3	CMX469AD3
24 pin SOIC	yes	DW	MX469DW	no		
24 pin TSSOP	no			yes	E2	CMX469AE2

A pin table for each device is provided below:

MX469:	MX469P	MX469D3	MX469DW	not avail.		
CMX469A:	CMX469AP6	CMX469AD3	not avail.	CMX469AE2		
Pkg Style:	**22 PDIP**	**20 SOIC**	**24 SOIC**	**24 TSSOP**	**Signal Name**	**Type**
Pin #	1	1	1	1	Xtal/Clock	input
	2	2	2	2	$\overline{\text{XTAL}}$	output
	3	3	3	3	TX Sync Out	output
	5	4	5	5	TX Signal Out	output
	6	5	7	7	TX Data In	input
	7	6	8	8	$\overline{\text{TX ENABLE}}$	input
	8	7	9	9	Bandpass Out	output
	9	8	10	10	RX Enable	input
	10	9	11	11	VBIAS	power
	11	10	12	12	VSS	power
	12	11	13	13	Unclocked Data Out	output
	13	12	14	14	Clocked Data Out	output
	14	13	15	15	Carrier Detect	output
	15	14	16	16	RX Signal In	input
	17	15	18	18	RX Sync Out	output
	16	16	19	19	$1200/\overline{2400}$ BPS Select	input
	18	17	20	20	4800 BPS Select	input
	19	18	21	21	Clock Rate	input
	20	19	23	22	Carrier Detect Time Constant	bi-directional
	22	20	24	24	VDD	power
	4, 21		4, 6, 17, 22	4, 6, 17, 23	No connection	