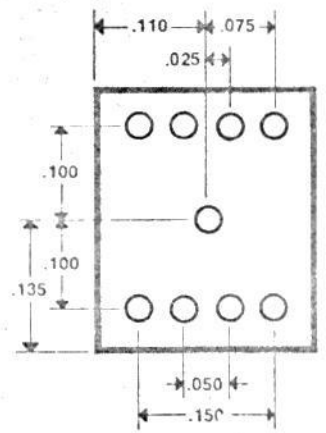
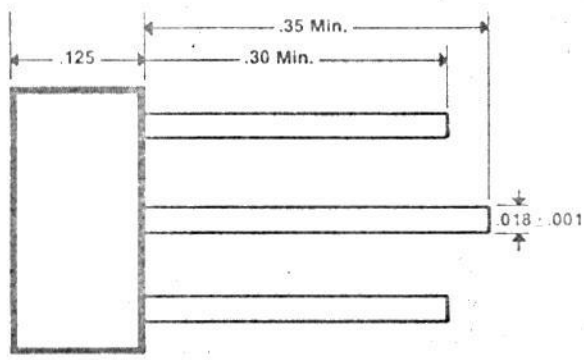
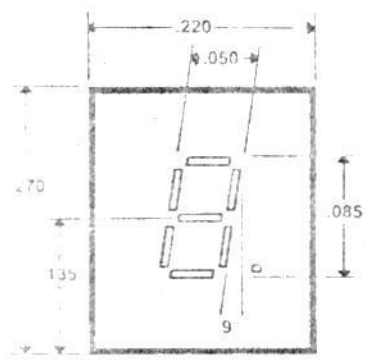
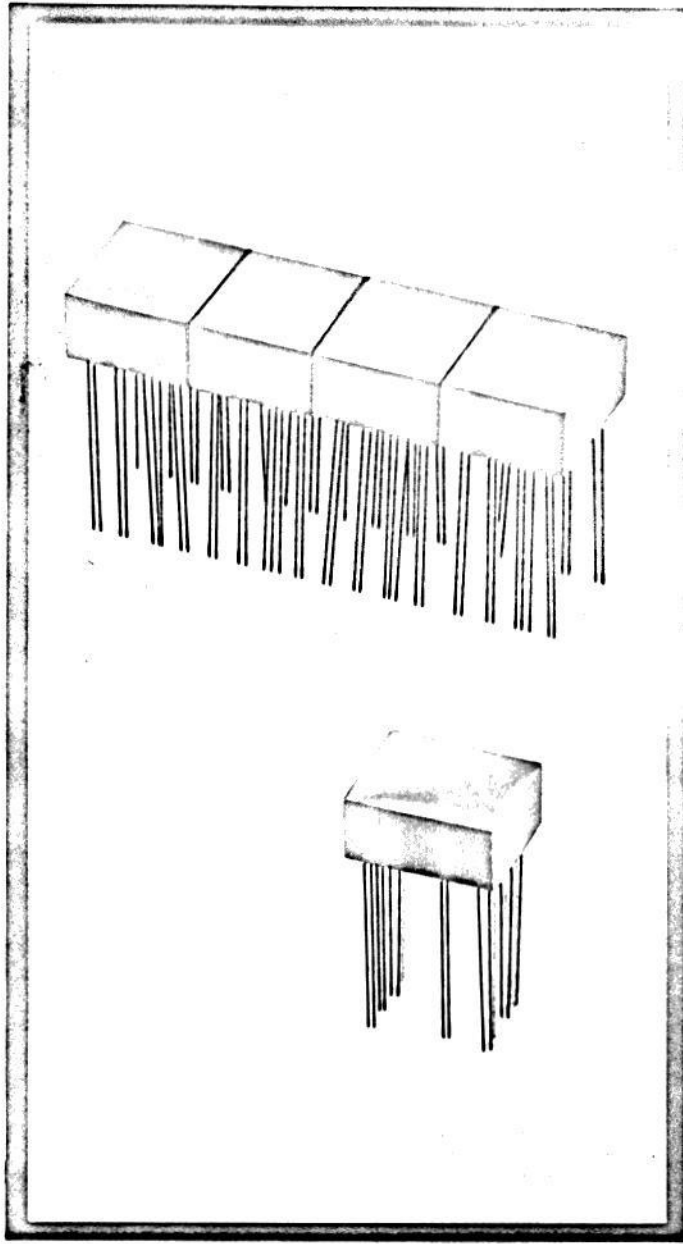


- Displays all numbers and nine letters
- High brightness at low current—0.13 mcd at 1.0 mA
- .085 Seven segment numeric
- End stackable for compact spacing—12 digits in 3" panel
- 9 Pin dual-in-line package
- IC compatible
- Choice of red (XMN-101 red) or orange (XMN-101 clear) light emission

The Xcitor XMN-101 is a seven segment, Gallium Phosphide, unmagnified light emitting device, available with a red or clear lens. The low power requirement, package size and high visibility makes these units ideally suited to portable and desk top instruments, calculators, field test equipment, bench test devices and other auxiliary equipment.

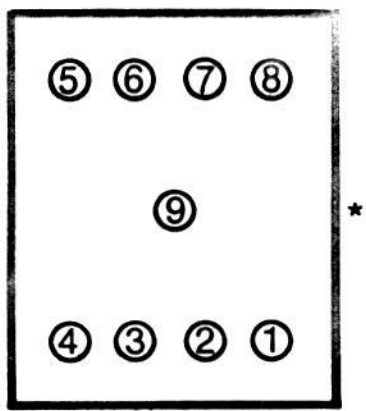


OPTO-ELECTRIC CHARACTERISTICS AT 25°C

Characteristics	Min.	Typical	Max.	Units	Conditions
Luminous Intensity	0.07	0.13	0.3	mil	$I_f = 1 \text{ mA}$
Forward Voltage (at peak current)*	1.7	1.9	2.5	V	$I_f \text{ (peak)} = 5.0 \text{ mA}$
Reverse Current		50		μA	$V_r = -3.0 \text{ V}$
Emission Peak Wave Length			690	nm	
Spectral Line Half Width			90	nm	

*1/10 duty cycle

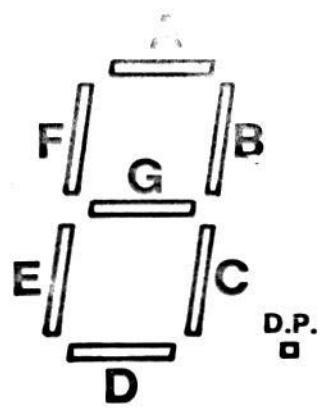
Pin Configuration



Package Description

- | Pin | Function |
|-----|--------------------------------|
| 1 | Segment B |
| 2 | Segment A |
| 3 | Segment G |
| 4 | Segment F |
| 5 | Segment E |
| 6 | Segment D |
| 7 | Segment C |
| 8 | Decimal Point |
| 9 | Common Cathode, Center Mounted |

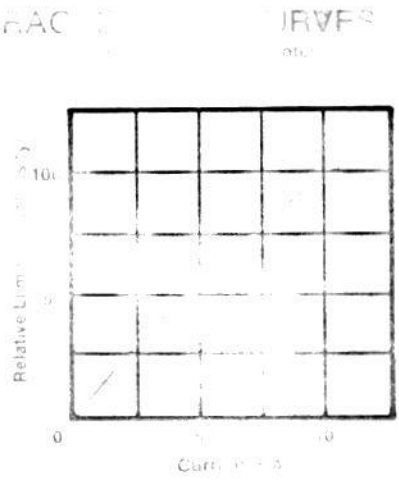
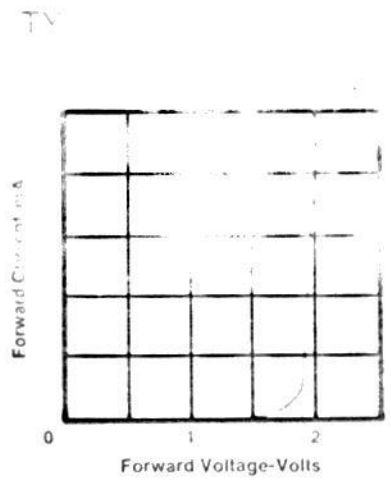
Segment Location



*Reference Point

Absolute Maximum Ratings at 25°C

Power Dissipation, Package	160 mW
Storage & Operating Temp	-20°C to 100°C
Continuous Forward Current/Segment	10 mA
Reverse Voltage	-3 Volts



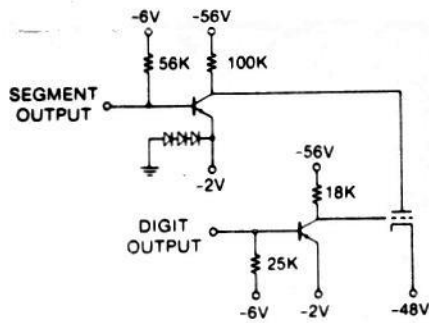
FEATURES:

- One Chip, Std. 40-Pin Dual-In-Line Package
- 8-Digit, 4-Functions
- Floating Point
- Zero Suppression
- Constant Operation
- Easily Interfaced to all displays
- Fully Decoded Digit & Segment Outputs
- Digit Blanking (Optional on 4204AL)
- Minimum Interface Components
- Left Display Entry (Right Hand Optional)
- OFF-THE-SHELF Delivery

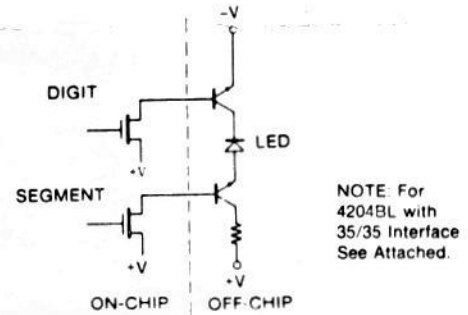
4204 AL
BL
CL

**ONE CHIP - EIGHT DIGIT
4-FUNCTION CALCULATOR
WITH CONSTANT K**

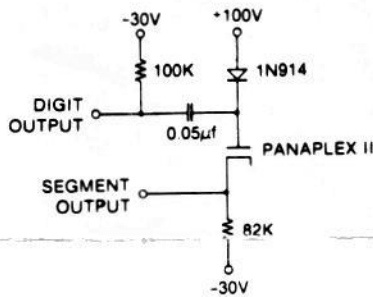
**FLUORESCENT TUBE INTERFACE
FOR 4204AL**



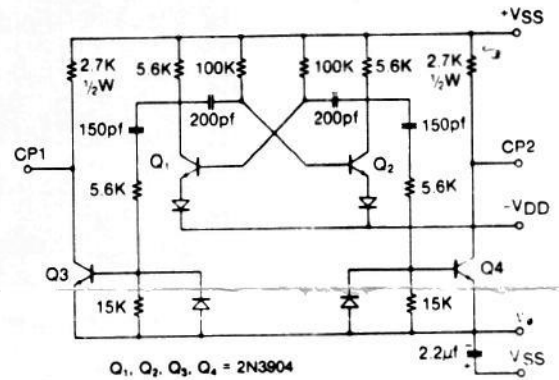
**LED INTERFACE CIRCUITRY
FOR 4204BL**



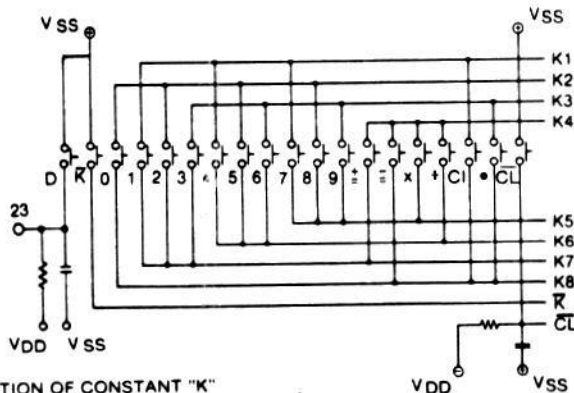
**PANAPLEX INTERFACE CIRCUITRY
FOR 4204CL**



TYPICAL CLOCK GENERATOR



KEYBOARD MATRIX

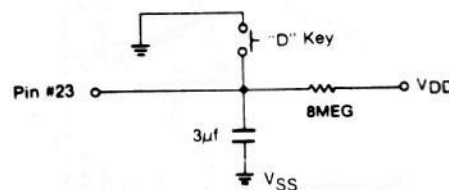


OPERATION OF CONSTANT "K"

- A) Enter Digit
 - B) Close "K" Switch
- This digit becomes the constant, and will remain so until "K" switch is opened, constant feature works in all 4 modes.

NOTE: "K" key must lock. "D" key used on 4204BL, CL only

**4204BL, CL DIGIT BLANKING
BATTERY SAVER FEATURE**

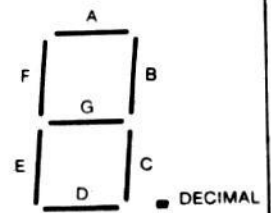


The R/C network shown will allow the display to remain ON for approx. 15 to 20 seconds. To restore display to original condition, depress "D" key.

IMPORTANT NOTE: If the Digit Blanking option is not desired, Pin #23 of the 4204BL and 4204CL must be connected to VSS. Failure to connect Pin #23 to VSS will result in a dim, flickering display, and difficulty in entering digits properly.

(Digit Blanking available on the 4204AL as a special option.)

**SEVEN SEGMENT
DISPLAY
DESIGNATION**



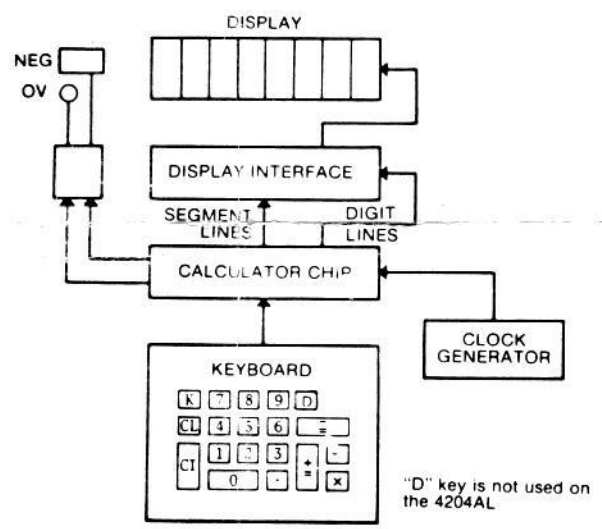
MAXIMUM GUARANTEED RATINGS 4204 AL, BL, CL

Pin Voltage, every pin against VSS through 1K resistor +0.5 to -30 Volts
 Operating Temperature Range 0 to +55°C
 Storage Temperature Range -50 to +150°C

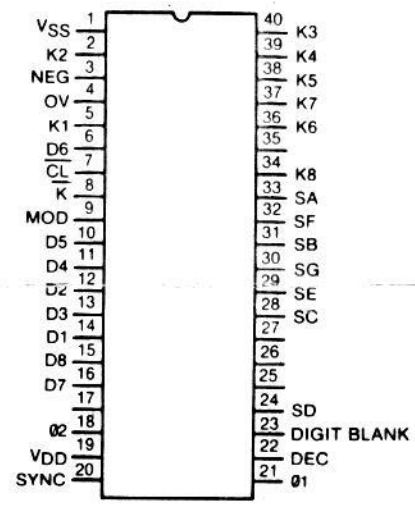
ELECTRICAL CHARACTERISTICS (TA = 0°C to +70°C, VDD = -7.0V ±10%)

Symbol	Characteristic	Min	Nom	Max	Unit	Conditions
VIL	Input Low Voltage			-1.0	V	VDD = -8.0V VR = -8.0V VR = 14V IOL = 1.0mA, VIPS = -6.3V V0 = -12.5V VOH = -15.5V VDD = -15.5V V0 = -12.5V VDD = -7.7V, V0 = -13.2V 01 = 10µs, 02 = 5µs, 35kHz at -14V at -14V at -1.0V 10% to 90% 90% to 10%
VIH	Input High Voltage	-4.0			V	
VCL	Clock Low Voltage			-1.0	V	
VCH	Clock High Voltage	-12.5	-14.0	-15.5	V	
IL	Input Leakage Current			-1.0	µA	
ICL	Clock Leakage Current			-5.0	µA	
VOL	Output Low Voltage other outputs		-0.5	-1.0	V	
IOH	Output High Current			-1.0	µA	
P	Power			100	mW	
01PW	Clock 1 Pulse Width	10			µs	
02PW	Clock 2 Pulse Width	5			µs	
0S0	Clock Separation	5			µs	
tr	Clock Rise Time	1			µs	
tf	Clock Fall Time	3			µs	

BLOCK DIAGRAM



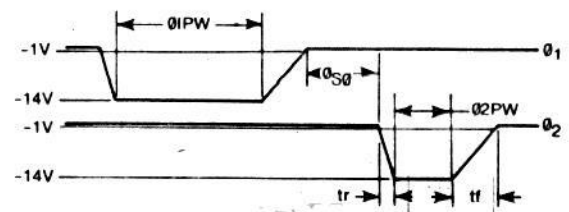
PIN CONFIGURATION



TOP VIEW

NOTE: Pin 23 is open on the 4204AL

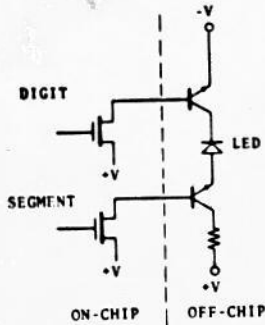
CLOCK TIMING DIAGRAM



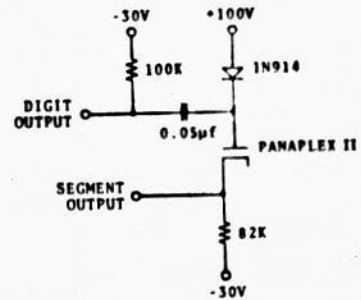
FEATURES:

- One Chip, Std. 40-Pin Dual-In-Line Package
 - 8-Digit, 4-Functions
 - Floating Point
 - Leading Zero Suppression
 - Automatic Constant K
 - Easy Interfaced to all displays
 - Fully Decoded Digit & Segment Outputs
 - Minimum Interface Components
 - OFF-THE-SHELF Delivery
- * RECOMMENDED V_{SS} = + 20 VOLTS

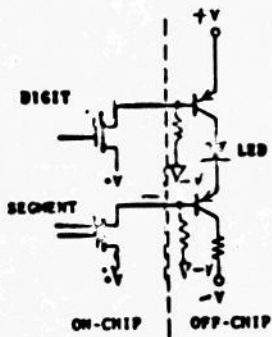
LED INTERFACE CIRCUITRY FOR NORTEC 4204BL



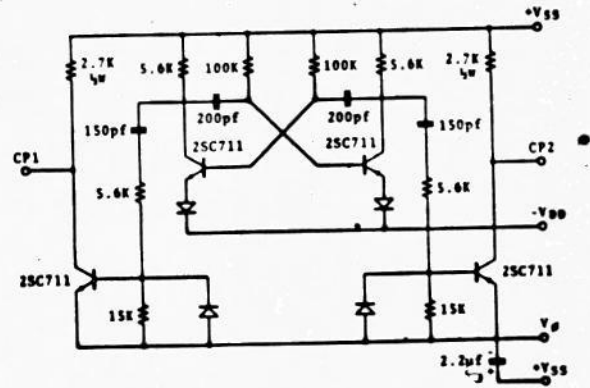
PANAPLEX INTERFACE CIRCUITRY FOR NORTEC 4204CL



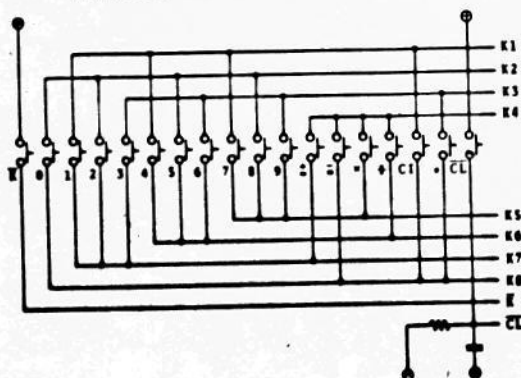
LED INTERFACE CIRCUITRY FOR NORTEC 4204AL



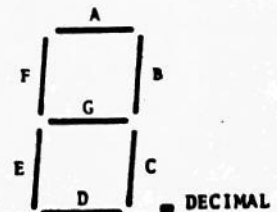
TYPICAL CLOCK GENERATOR



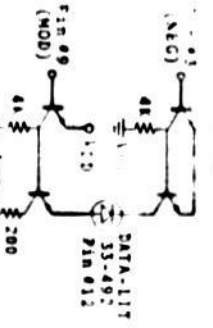
KEYBOARD INTERCONNECT



SEVEN SEGMENT DISPLAY DESIGNATION

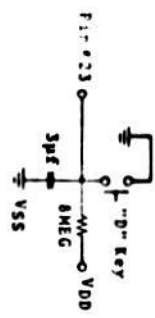


TYPICAL NEEDLE INDICATOR



- 1) For 10-bit Lutronix DATA-LIT 33-492. For other displays, use discrete LED display.
- 2) To use a filament-type indicator, refer to schematic attached to Data Sheet.

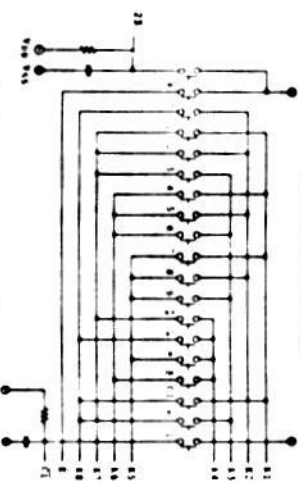
DIGIT BLANKING BATTERY SAVER FEATURE



The R/C network shown will allow the display to remain ON for approx. 15 to 20 seconds. To restore display to original condition, depress "D" key.

IMPORTANT NOTE: If the Digit Blanking option is not desired, pin 23 of the 4704BL and 4704CL must be connected to VSS. Failure to connect pin 23 to VSS will result in a dim, flickering display, and difficulty in entering digits properly.

KEYBOARD MATRIX

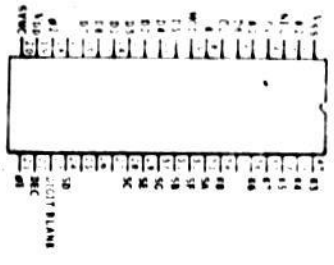


OPERATION OF CONSTANT "K"

- Enter **DIGIT**
- Depress **"K"** key

This digit becomes the constant, and will remain so until "K" key is pressed again. Constant feature works in all 4 modes.

PIN CONFIGURATION



MAXIMUM GUARANTEED RATINGS

Pin Voltage, every pin against VSS through 1k resistor . . . 0.5 to -10 Volts

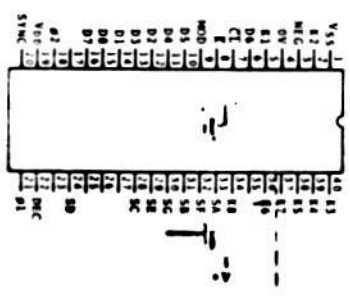
Operating Temperature Range 0 to +70 °C

Storage Temperature Range -50 to +150 °C

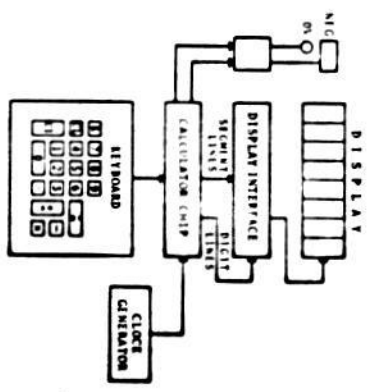
ELECTRICAL CHARACTERISTICS (TA = 0°C to +70°C, VDD = -6.5V ±10%)

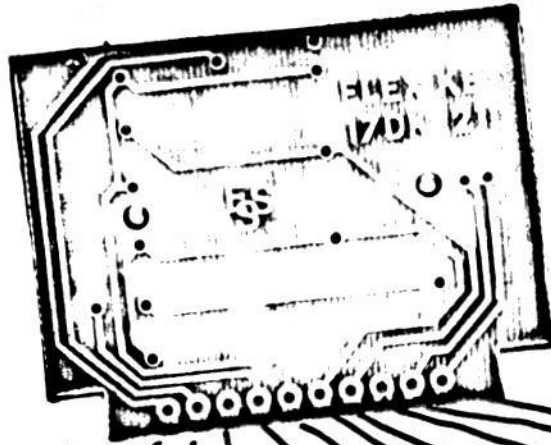
Symbol	Characteristic	Min	Nom	Max	Unit	COND. 100
VIL	Input Low Voltage			-1.0	V	
VIH	Input High Voltage	-4.0			V	
VCL	Clock Low Voltage			-1.0	V	
VCH	Clock High Voltage	-10.8	-12.0	-13.2	V	
IL	Input Leakage Current			-1.0	µA	VR = -8.0V
ICL	Clock Leakage Current			-5.0	µA	VR = -14V
IOH	KB Output Low Voltage			-0.5	V	VDD = -5.9V, VCL = -10.8V
VOL	Output Low Voltage other outputs			-0.5	V	IOL = 1.0mA, VDD = -5.9V VOL = -10.8V
IOH	Output High Current			-1.0	µA	VOH = -15V, VDD = -13.2V
P	Power			100	mW	VDD = 7.1V, VCH = 13.2V f1 = 7µs, f2 = 3µs, 80MHz
f1PW	Clock 1 Pulse Width			7	µs	at -10V
f2PW	Clock 2 Pulse Width			3	µs	at -10V
fS	Clock Separation			1	µs	at -1.0V

PIN CONFIGURATION



BLOCK DIAGRAM





K1 K2 K3 K4 K5 K7 K6 K8 C gnd

