

# MICROCOMPUTER and PERIPHERAL LSI's

## Peripheral LSI's

Type No.	Function	Maximum Ratings (Ta=25°C)	Electrical Characteristics (Ta=25°C)								
			Item	Symbol	Condition	min.	typ.	max.	Unit		
MNG024	CMOS 16-Function Remote Control Circuit	V <sub>DD</sub> = -0.3 ~ +3V V <sub>I</sub> = -0.3 ~ V <sub>DD</sub> + 0.3V V <sub>O</sub> = -0.3 ~ V <sub>DD</sub> + 0.3V T <sub>opr</sub> = -20 ~ +70°C T <sub>stg</sub> = -40 ~ +100°C	"H" Level Input Voltage	V <sub>IH</sub>	OSC1, OSC2	1.1		1.5	V		
			"L" Level Input Voltage	V <sub>IL</sub>				0.3	V		
			Input Current	I <sub>IH</sub>	KY1~KY2, V <sub>I</sub> =1.5V	7	15		μA		
			"H" Level Output Current	I <sub>OH1</sub>	DT1~DT4, V <sub>O</sub> =1.2V	-100			μA		
			"L" Level Output Current	I <sub>OH2</sub>	OUT1, V <sub>DD</sub> =1.1V, V <sub>O</sub> =0.8V	-600			μA		
			"L" Level Output Current	I <sub>OL1</sub>	OUT1, V <sub>DD</sub> =1.1V, V <sub>O</sub> =0.3V	15			μA		
			Operating Condition	"H" Level Output Current	I <sub>OH3</sub>	OUT2, V <sub>DD</sub> =1.1V, V <sub>O</sub> =0.8V	-300			μA	
				"L" Level Output Current	I <sub>OL2</sub>	CUT2, V <sub>DD</sub> =1.1V, V <sub>O</sub> =0.3V	15			μA	
			V <sub>DD</sub> =1.5V V <sub>SS</sub> =0V f <sub>osc</sub> =600Hz Ta=25°C	"H" Level Output Current	I <sub>OH4</sub>	OSC2, OSC3, V <sub>O</sub> =1.2V	-60			μA	
				"L" Level Output Current	I <sub>OL3</sub>	OSC2, OSC3, V <sub>O</sub> =0.3V	60			μA	
ΔMNG025	CMOS Multi-Function Remote Control Circuit	V <sub>DD</sub> = -0.3 ~ +5V V <sub>I</sub> = -0.3 ~ V <sub>DD</sub> + 0.3V V <sub>O</sub> = -0.3 ~ V <sub>DD</sub> + 0.3V T <sub>opr</sub> = -30 ~ +70°C T <sub>stg</sub> = -35 ~ +100°C	Supply Current	I <sub>DD</sub>	Without key input			30	μA		
			Power Consumption	P <sub>tot</sub>				60	μW		
			Input Pin	KY1~KY7	"H" Level Voltage	V <sub>IH</sub>		2.4			V
					"L" Level Voltage	V <sub>IL</sub>				0.6	V
					Input Current	I <sub>I</sub>	V <sub>I</sub> =3V	10		50	μA
			Operating Condition	CNT OSC2 MODE	"H" Level Voltage	V <sub>IH</sub>		2.4			V
					"L" Level Voltage	V <sub>IL</sub>				0.6	V
			V <sub>DD</sub> =3V V <sub>SS</sub> =0V Ta=25°C	DT1~DT4	"H" Level Current	I <sub>OH1</sub>	V <sub>O</sub> =2.4V	-100			μA
					"H" Level Current	I <sub>OH2</sub>	V <sub>O</sub> =0.8V	-1.5			mA
				OUT	"L" Level Current	I <sub>OL2</sub>	V <sub>O</sub> =0.6V	50			μA
"H" Level Current	I <sub>OH3</sub>	V <sub>O</sub> =2.4V			-100			μA			
OSC1	"L" Level Current	I <sub>OL3</sub>	V <sub>O</sub> =0.6V	100			μA				
	MNG044	CMOS Frequency Synthesizer for TV	V <sub>DD</sub> = -0.3 ~ +7V V <sub>I</sub> = -0.3 ~ +7V V <sub>O</sub> = -0.3 ~ +7V P <sub>D</sub> = 30mW T <sub>opr</sub> = -20 ~ +70°C T <sub>stg</sub> = -55 ~ +100°C	Supply Current	I <sub>DD</sub>	Without load		1	5	mA	
Power Consumption				P <sub>tot</sub>	RC=1/3667, SC=1/1023			5	25	mW	
Input Pin				LF1	Input Frequency Upper Limit	f <sub>i</sub>		3.7			MHz
					Input Voltage Swing	V <sub>i</sub>		1			V <sub>P-P</sub>
					Input Current	I <sub>I</sub>	V <sub>I</sub> =V <sub>SS</sub> ~V <sub>DD</sub>				±30
Operating Condition				PI0~3 CI0~2 LD1	"H" Level Input Voltage	V <sub>IH2</sub>		2.4		V <sub>DD</sub>	V
					"L" Level Output Current	V <sub>IL2</sub>		V <sub>SS</sub>		0.8	V
V <sub>DD</sub> =5V V <sub>SS</sub> =0V Ta=-20~+70°C				PDO	"H" Level Output Current	I <sub>OH</sub>	V <sub>O</sub> =3V	-0.8			mA
					"L" Level Output Voltage	I <sub>OL</sub>	V <sub>O</sub> =2V	+0.8			mA
				TMO	"H" Level Output Voltage	V <sub>OP</sub>	I <sub>OH</sub> =-100μA	3			V
	"L" Level Output Voltage	V <sub>OL</sub>	I <sub>OL</sub> =100μA				0.4	V			
Q1, QO	Osc. Frequency	f <sub>osc</sub>	C <sub>I</sub> =22pF, C <sub>O</sub> =30±10pF		3.58		MHz				
MNG047	CMOS PLL Frequency Synthesizer for FM/AM Radio	V <sub>DD</sub> = -0.3 ~ +10V V <sub>I</sub> = -0.3 ~ +10V V <sub>O</sub> = -0.3 ~ +10V P <sub>D</sub> = 50mW T <sub>opr</sub> = -30 ~ +70°C T <sub>stg</sub> = -55 ~ +100°C	Supply Current	I <sub>DD</sub>	V <sub>DD</sub> =5V, Ta=25°C		3	5	mA		
			Power Consumption	P <sub>tot</sub>			15	25	mW		
			"H" Level Input Voltage	V <sub>IH</sub>	P0~P3, C0~C2, LD.	2.4		V <sub>DD</sub>	V		
			"L" Level Input Voltage	V <sub>IL</sub>	V <sub>DD</sub> =5V	V <sub>SS</sub>		0.8	V		
			Input Frequency Upper Limit	f <sub>i max</sub>	V <sub>DD</sub> =4.5~6.5V	4			MHz		
					V <sub>DD</sub> =5.5~6.5V	6			MHz		
			Oscillation Frequency	f <sub>osc</sub>	OSC1, OSC2		11.52		MHz		
			Operating Condition	"H" Level Output Current	I <sub>OH</sub>	PD	V <sub>O</sub> =3V	-0.8		mA	
				"L" Level Output Current	I <sub>OL</sub>		V <sub>O</sub> =2V	0.8		mA	
			V <sub>DD</sub> =5V V <sub>SS</sub> =0V Ta=-30~+70°C	"H" Level Output Voltage	V <sub>OH</sub>	CPO, QO	V <sub>DD</sub> =5V I <sub>OH</sub> =-100μA	4		V	
"L" Level Output Voltage	V <sub>OL</sub>	V <sub>DD</sub> =5V I <sub>OL</sub> =100μA			0.4		V				
Input Capacitance	C <sub>I</sub>	V <sub>I</sub> =2V			5		pF				
Output Capacitance	C <sub>O</sub>	V <sub>O</sub> =2V			7		pF				

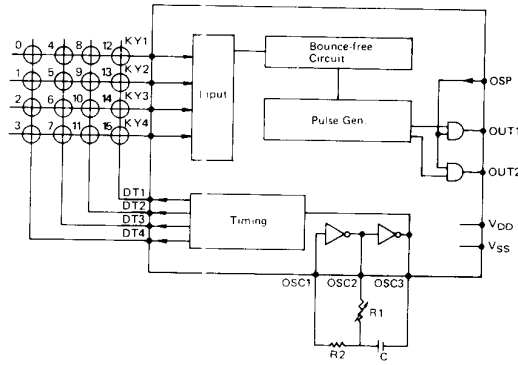
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Peripheral LSI's

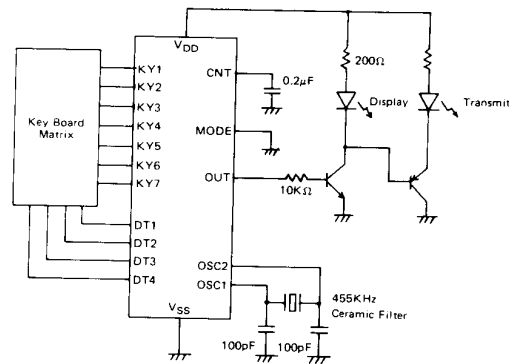
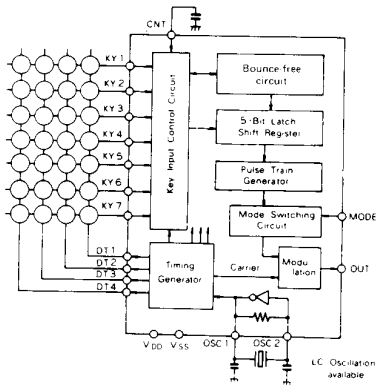
Block Diagram

Application Circuit

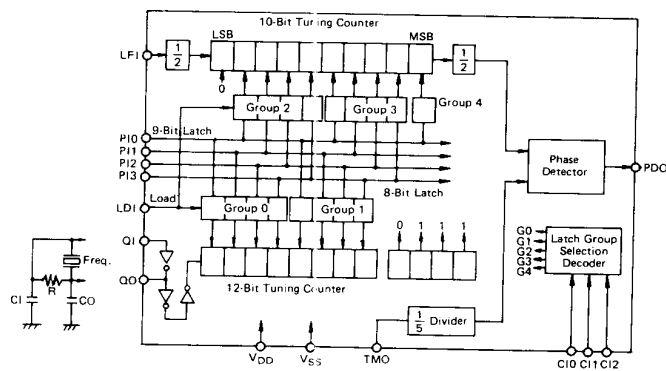
MN6024 (Package L-13, 16-Lead Plastic DIL)



MN6025 (Package L-15, 18-Lead Plastic DIL)



MN6044 (Package L-14, 16-Lead Plastic DIL)



MN6047 (Package L-13, 16-Lead Plastic DIL)

