十速科技股份有限公司
tenx technology inc.

Advance Information

8-Bit Micro-Controller

TM57PA10

Electrical Characteristics

Application Note

Tenx reserves the right to change or discontinue this product without notice.

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PRODUCT NAME

TM57PA10

TITLE

TM57PA10 Electrical Characteristics

APPLICATION NOTE

The electrical characteristics described in the document are for reference only. The operating current is measured with no loading at room temperature (25℃). All the characteristics will be different subject to the process variation, temperature, Option, loading and operating voltage etc. IC from different lots will be slightly different due to the drift of the manufacturing processes.

1. TM57PA10 State current

TM57PA10 IRC (4MHz) 25℃ LVR disable										
Unit	mA	mA	mA	mA	mA	mA	mA	mA	mA	mA
5V	v		v		v		v		v	
3V		v		v		v		v		v
CLKO			v	v						
WKT					v	v				
PWM							v	v		
Sleep									v	v
Operating Current	2.24	1	2.35	1.08	2.24	1	2.24	1	0	0

TM57PA10 ERC (6.7KΩ/33PF) 25℃ LVR disable										
Unit	mA	mA	mA	mA	mA	mA	mA	mA	mA	mA
5V	v		v		v		v		v	
3V		v		v		v		v		v
CLKO			v	v						
WKT					v	v				
PWM							v	v		
Sleep									v	v
Operating Current	2.01	0.87	2.06	0.9	2.01	0.87	2.01	0.87	0	0

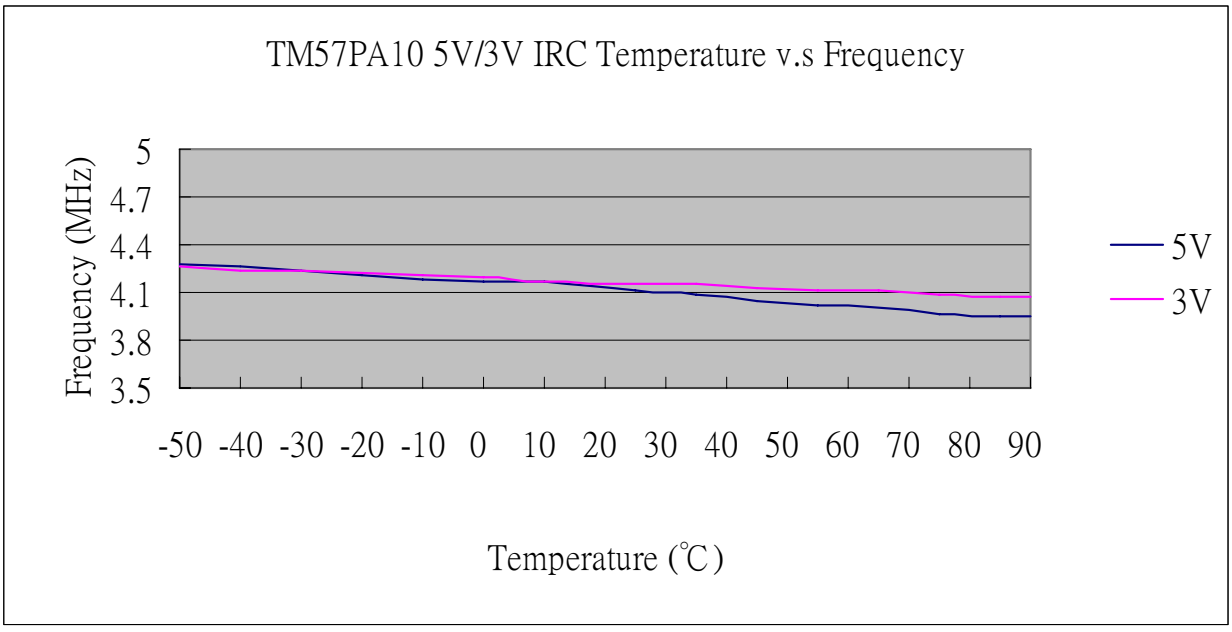
TM57PA10 X'TAL (4MHz) 25℃ LVR disable								
Unit	mA	mA	mA	mA	mA	mA	mA	mA
5V	v		v		v		v	
3V		v		v		v		v
WKT			v	v				
PWM					v	v		
Sleep							v	v
Operating Current	**2.99**	**0.96**	**2.99**	**0.96**	**2.99**	**0.96**	**0**	**0**

2. IRC vs. Frequency vs. Operating Current vs. Temperature

1. -50℃ ~ 90℃
2. 5V / 3V
3. IRC 4MHz
4. LVR disable

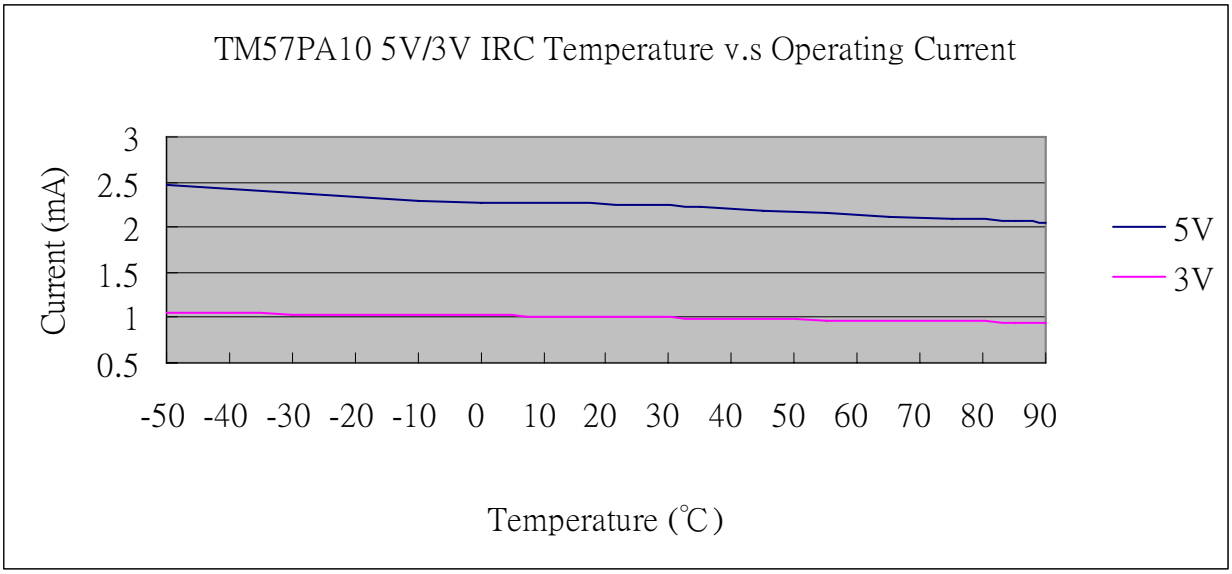
Test Description: When the IRC(4MHz) temperature is in the range of -50℃ ~ 90℃, measure the frequency change of CLKO.

MHz	-50℃	-40℃	-30℃	-20℃	-10℃	0℃	10℃	25℃	35℃	45℃	55℃	65℃	75℃	85℃	90℃
5V	4.28	4.26	4.23	4.21	4.18	4.17	4.17	4.11	4.09	4.05	4.02	4.01	3.97	3.95	3.95
3V	4.26	4.24	4.23	4.22	4.21	4.19	4.17	4.16	4.15	4.13	4.11	4.11	4.09	4.07	4.07



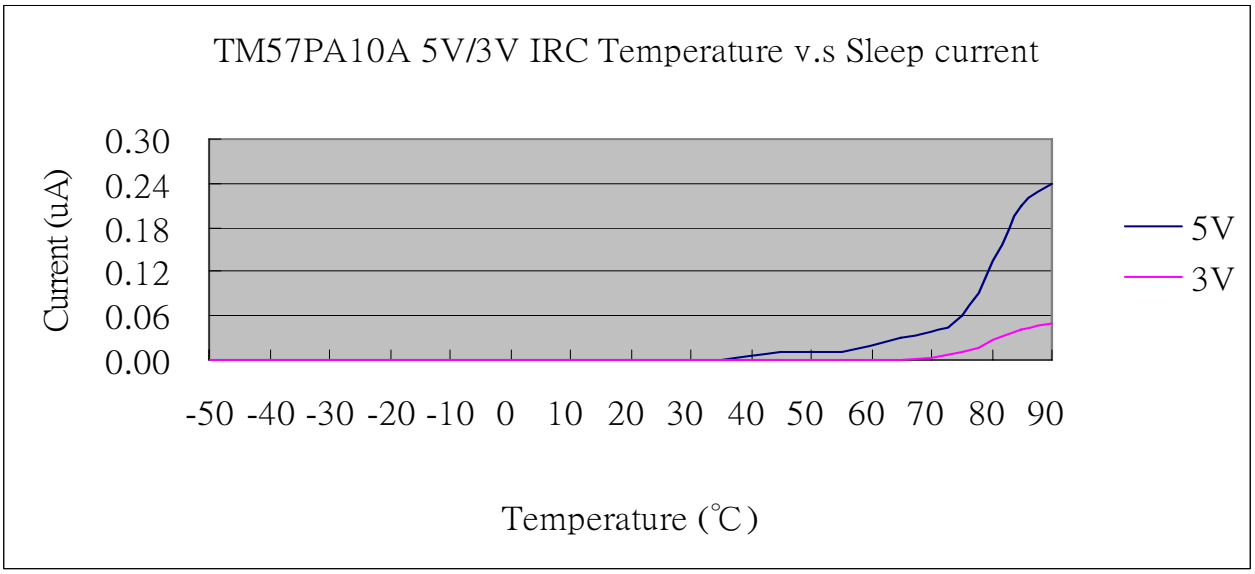
Test Description: When the IRC(4MHz) temperature is in the range of -50℃ ~ 90℃, measure the operating current.

mA	-50℃	-40℃	-30℃	-20℃	-10℃	0℃	10℃	25℃	35℃	45℃	55℃	65℃	75℃	85℃	90℃
5V	2.47	2.43	2.39	2.34	2.3	2.28	2.26	2.24	2.22	2.18	2.15	2.12	2.09	2.06	2.05
3V	1.05	1.05	1.04	1.04	1.03	1.02	1.01	1	0.99	0.98	0.97	0.97	0.96	0.95	0.95



Test Description: When the IRC(4MHz) temperature is in the range of -50℃ ~ 90℃, measure the Sleep current.

uA	-50℃	-40℃	-30℃	-20℃	-10℃	0℃	10℃	25℃	35℃	45℃	55℃	65℃	75℃	85℃	90℃
5V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.06	0.21	0.24
3V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.05

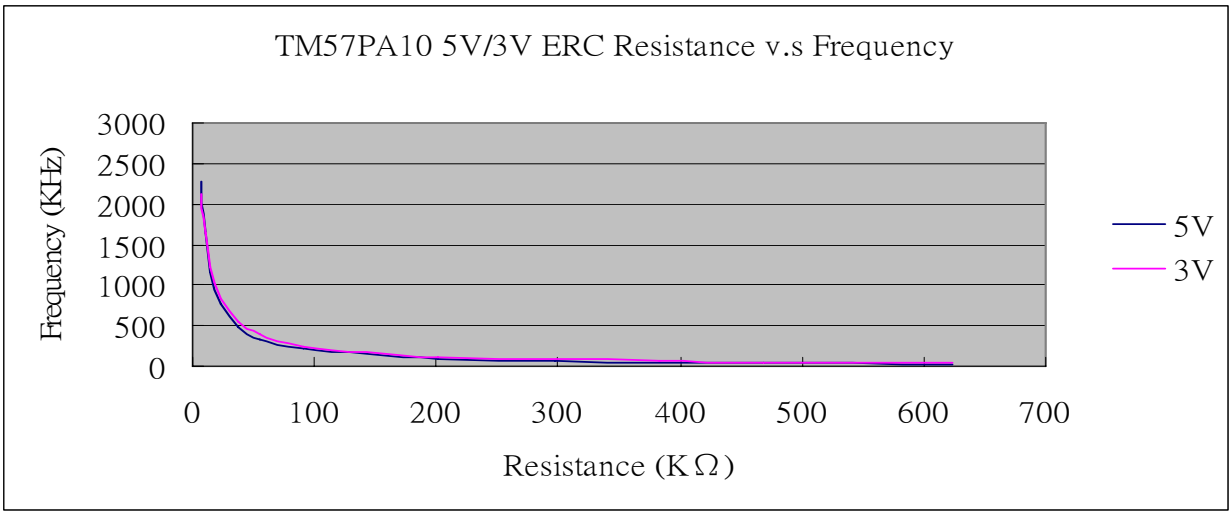


3. ERC vs. Frequency vs. Operating Current vs. Temperature

1. 25℃
2. 5V / 3V
3. ERC (33PF)
4. LVR disable

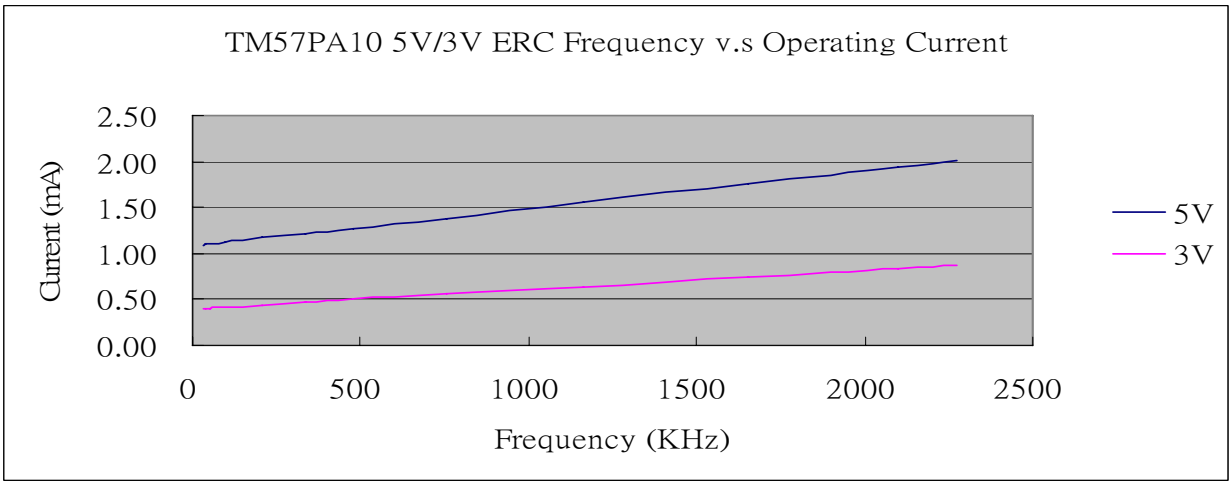
Test description: When the ERC (33PF) temperature is at 25℃, measure the frequency changes at different resistances.

KHz	6.7KΩ	7.5KΩ	10KΩ	15KΩ	24KΩ	38KΩ	55KΩ	91KΩ	201KΩ	297KΩ	383KΩ	468KΩ	624KΩ
5V	2273	2100	1653	1163	759	481	338	209	96	64	50	40	30
3V	2127	2007	1653	1227	837	545	390	245	114	78	60	50	36



Test description: When the ERC (33PF) temperature is at 25℃, measure the operating currents at different frequency.

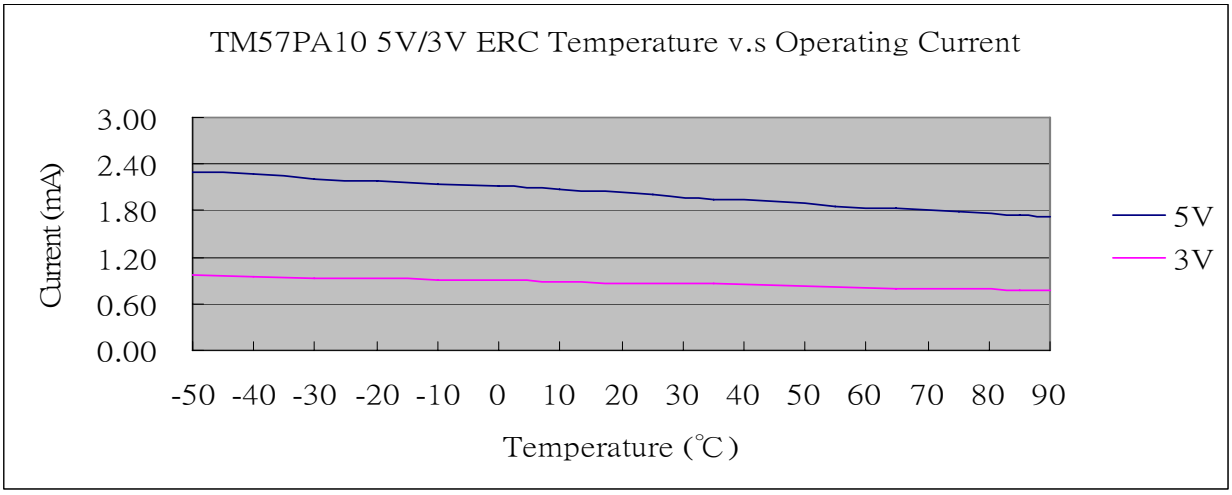
mA	2273KHz	2100KHz	1653KHz	1163KHz	759KHz	481KHz	338KHz	209KHz	96KHz	64KHz	50KHz	40KHz	30KHz
5V	2.01	1.93	1.75	1.55	1.38	1.27	1.22	1.17	1.12	1.11	1.10	1.10	1.09
3V	0.87	0.84	0.74	0.64	0.56	0.5	0.47	0.44	0.42	0.41	0.4	0.4	0.4



1. -50℃ ~ 90℃
2. 5V / 3V
3. ERC (6.7KΩ/33PF)
4. LVR disable

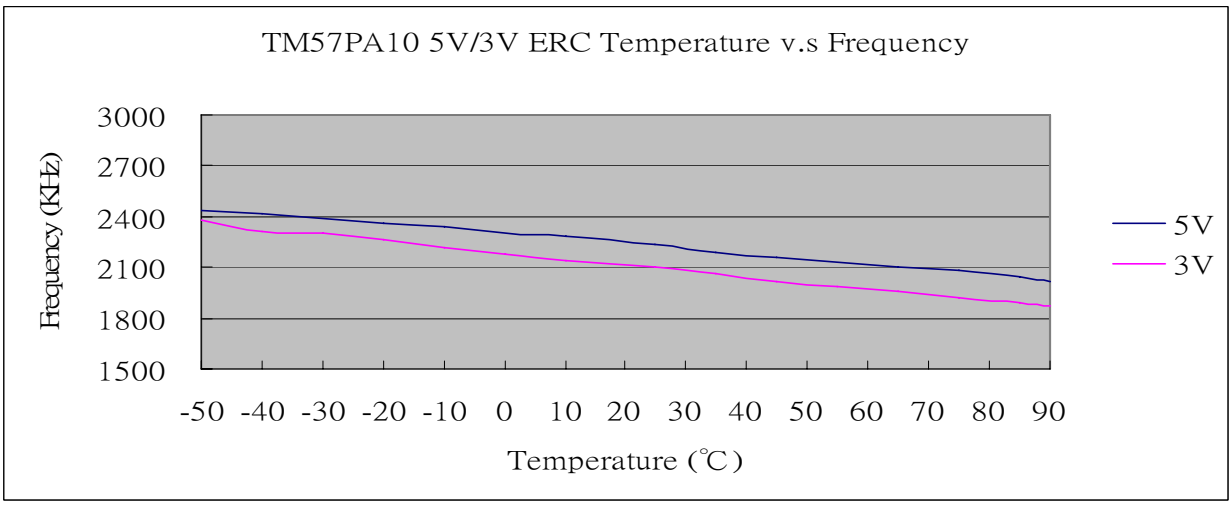
Test description: When the ERC (6.7KΩ/33PF) temperature is in the range of -50℃ ~ 90℃, measure the operating current.

mA	-50℃	-40℃	-30℃	-20℃	-10℃	0℃	10℃	25℃	35℃	45℃	55℃	65℃	75℃	85℃	90℃
5V	2.30	2.27	2.21	2.19	2.15	2.12	2.07	2.00	1.95	1.91	1.86	1.82	1.79	1.75	1.72
3V	0.96	0.95	0.92	0.92	0.91	0.90	0.88	0.86	0.85	0.83	0.81	0.80	0.79	0.78	0.77



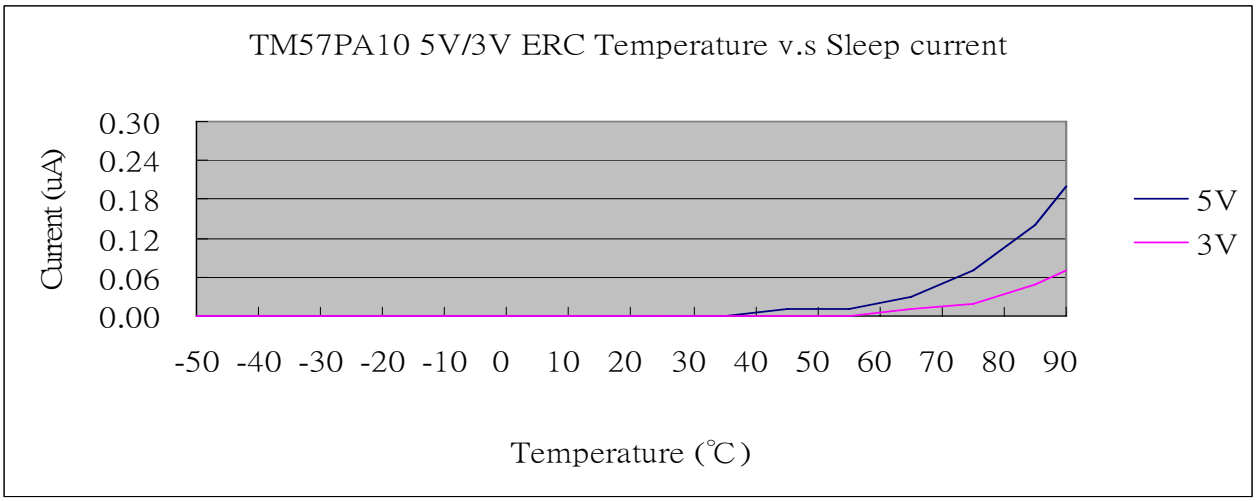
Test Description: When ERC (6.7KΩ/33PF) temperature is in the range of -50℃ ~ 90℃, measure the frequency change of ERC.

KHz	-50℃	-40℃	-30℃	-20℃	-10℃	0℃	10℃	25℃	35℃	45℃	55℃	65℃	75℃	85℃	90℃
5V	2440	2420	2393	2360	2340	2300	2280	2240	2187	2160	2127	2100	2080	2040	2020
3V	2380	2313	2300	2260	2220	2180	2140	2100	2060	2020	1991	1956	1924	1888	1872



Test Description: When ERC (6.7KΩ/33PF) temperature is in the range of -50℃ ~ 90℃, measure the Sleep current.

uA	-50℃	-40℃	-30℃	-20℃	-10℃	0℃	10℃	25℃	35℃	45℃	55℃	65℃	75℃	85℃	90℃
5V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.07	0.14	0.20
3V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.05	0.07



4. X'TAL vs. Operating Current

1. 25℃
2. 5V / 3V
3. X'TAL
4. LVR disable

Test description: When the X'TAL temperature is at 25℃, measure the operating currents at different frequencies.

mA	4MHz	6MHz	8MHz	10MHz	12MHz
5V	2.99	3.18	3.65	4.31	4.87
3V	0.96	1.24	1.53	1.83	2.08