



8-Bit Micro-Controller

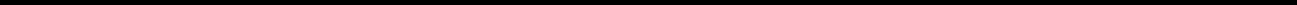
TM57PE11

Electrical Characteristics

Application Note

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

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PRODUCT NAME**TM57PE11****TITLE**

TM57PE11 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°C). 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. TM57PE11 State current

TM57PE11(IRC 4MHz) 25°C LVR disable								
Unit	mA	mA	mA	mA	mA	mA	mA	mA
5V	✓		✓		✓		✓	
3V		✓		✓		✓		✓
CLKO			✓	✓				
WKT					✓	✓		
Sleep							✓	✓
Operating Current	1.62	0.72	1.68	0.76	1.62	0.72	0	0

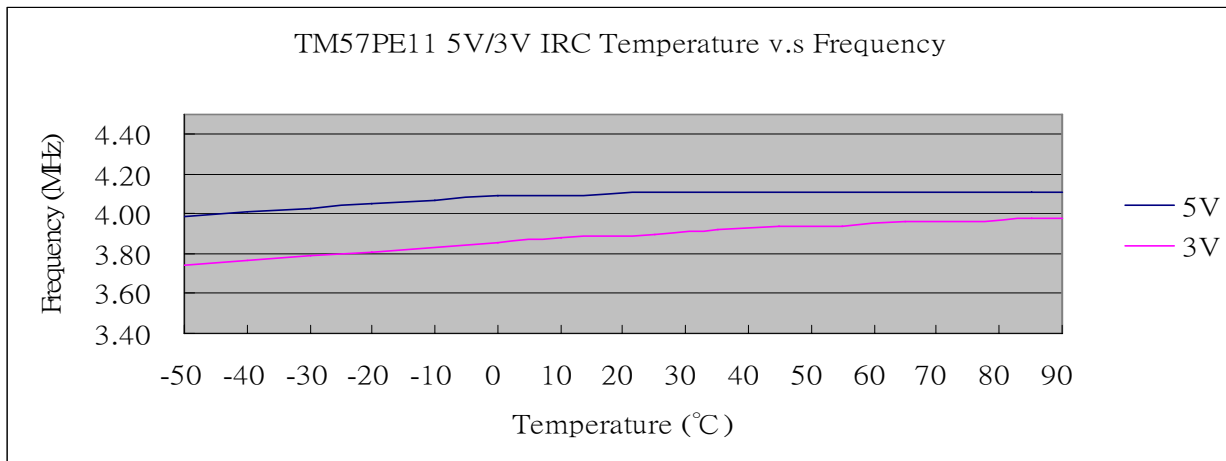
TM57PE11 ERC(6.7K Ω /33PF) 25°C LVR disable								
Unit	mA	mA	mA	mA	mA	mA	mA	mA
5V	✓		✓		✓		✓	
3V		✓		✓		✓		✓
CLKO			✓	✓				
WKT					✓	✓		
Sleep							✓	✓
Operating Current	1.55	0.75	1.58	0.77	1.55	0.75	0	0

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

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

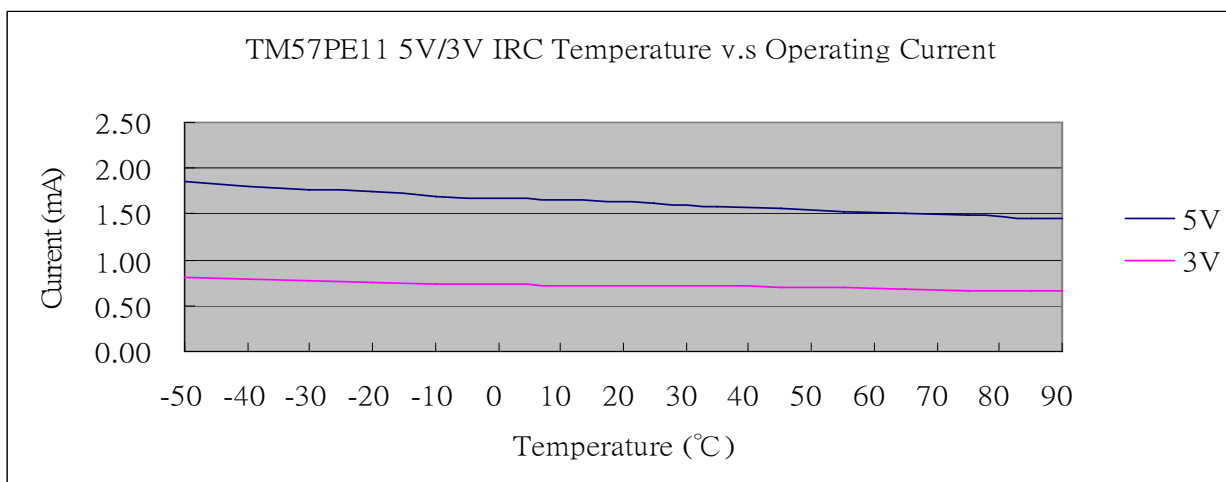
Test Description: When the IRC(4MHz) temperature is in the range of -50°C ~ 90°C, measure the frequency change of CLKO.

MHz	-50°C	-40°C	-30°C	-20°C	-10°C	0°C	10°C	25°C	35°C	45°C	55°C	65°C	75°C	85°C	90°C
5V	3.99	4.01	4.03	4.05	4.07	4.09	4.09	4.11	4.11	4.11	4.11	4.11	4.11	4.11	4.11
3V	3.74	3.77	3.79	3.81	3.83	3.86	3.88	3.90	3.92	3.94	3.94	3.96	3.96	3.98	3.98



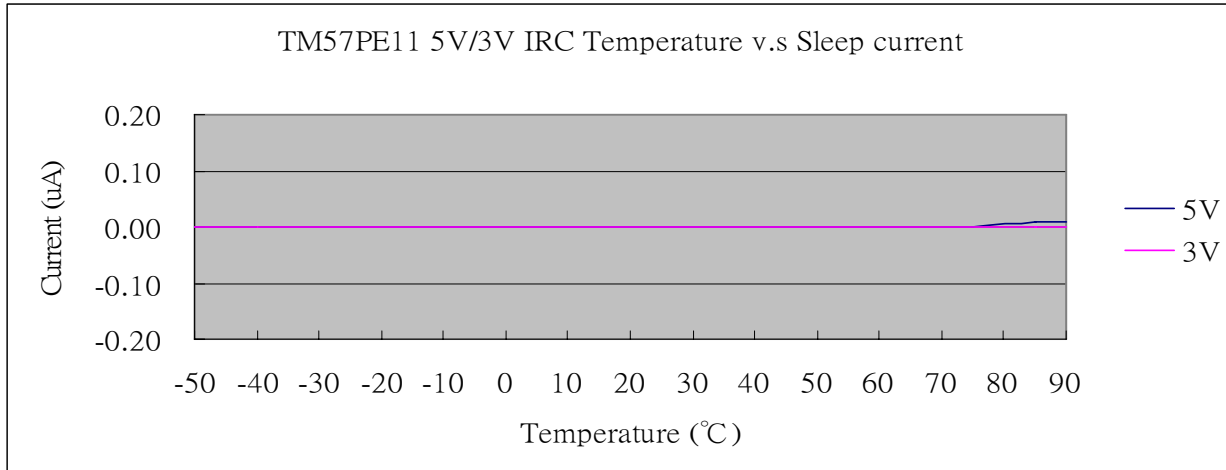
Test Description: When the IRC(4MHz) temperature is in the range of -50°C ~ 90°C, measure the operating current.

mA	-50°C	-40°C	-30°C	-20°C	-10°C	0°C	10°C	25°C	35°C	45°C	55°C	65°C	75°C	85°C	90°C
5V	1.85	1.81	1.77	1.74	1.70	1.67	1.65	1.62	1.58	1.56	1.53	1.51	1.49	1.46	1.46
3V	0.80	0.79	0.77	0.76	0.74	0.73	0.72	0.72	0.71	0.70	0.69	0.68	0.67	0.66	0.66



Test Description: When the IRC(4MHz) temperature is in the range of $-50^{\circ}\text{C} \sim 90^{\circ}\text{C}$, measure the Sleep current

μA	-50°C	-40°C	-30°C	-20°C	-10°C	0°C	10°C	25°C	35°C	45°C	55°C	65°C	75°C	85°C	90°C
5V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
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	0.00	0.00	0.00

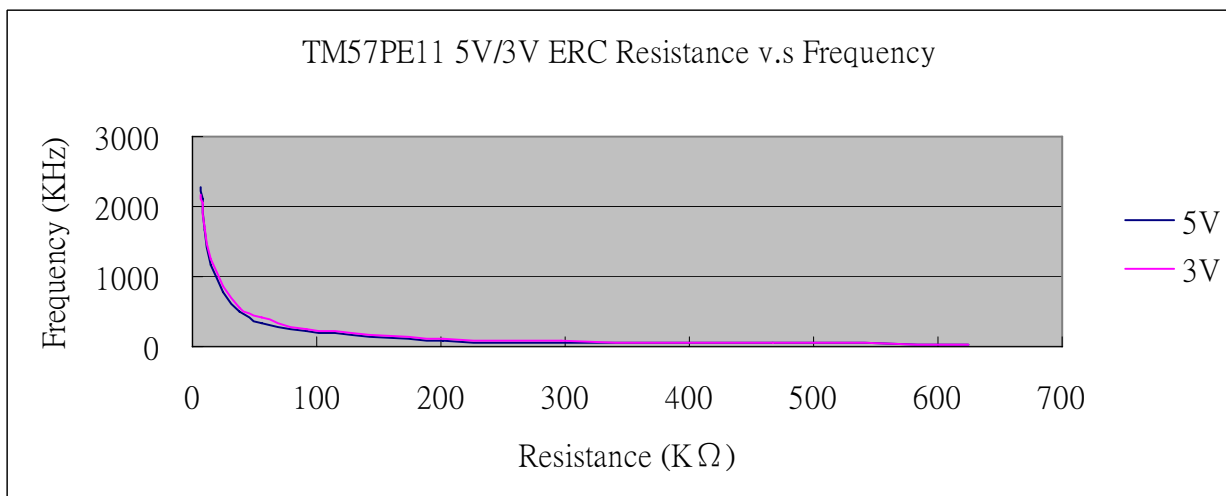


3. ERC vs. Frequency vs. Operating Current vs. Temperature

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

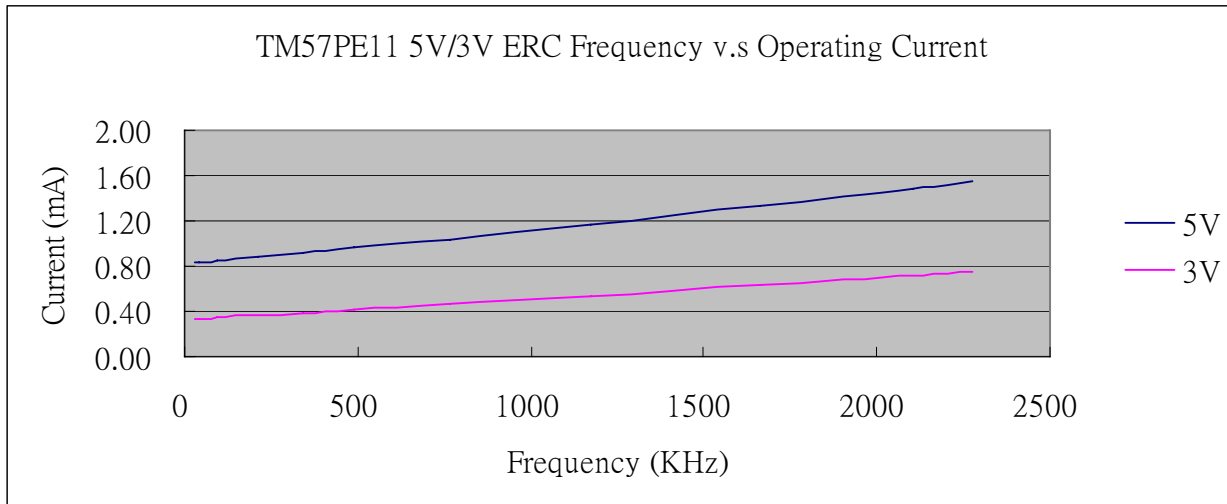
Test description: When the ERC (33PF) temperature is at 25°C , measure the frequency changes at different resistances.

KHz	6.7K Ω	7.5K Ω	10K Ω	15K Ω	24K Ω	38K Ω	55K Ω	91K Ω	201K Ω	297K Ω	383K Ω	468K Ω	624K Ω
5V	2273	2107	1663	1173	769	490	343	212	97	66	51	42	31
3V	2180	2053	1700	1263	861	561	403	253	117	79	61	51	38



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

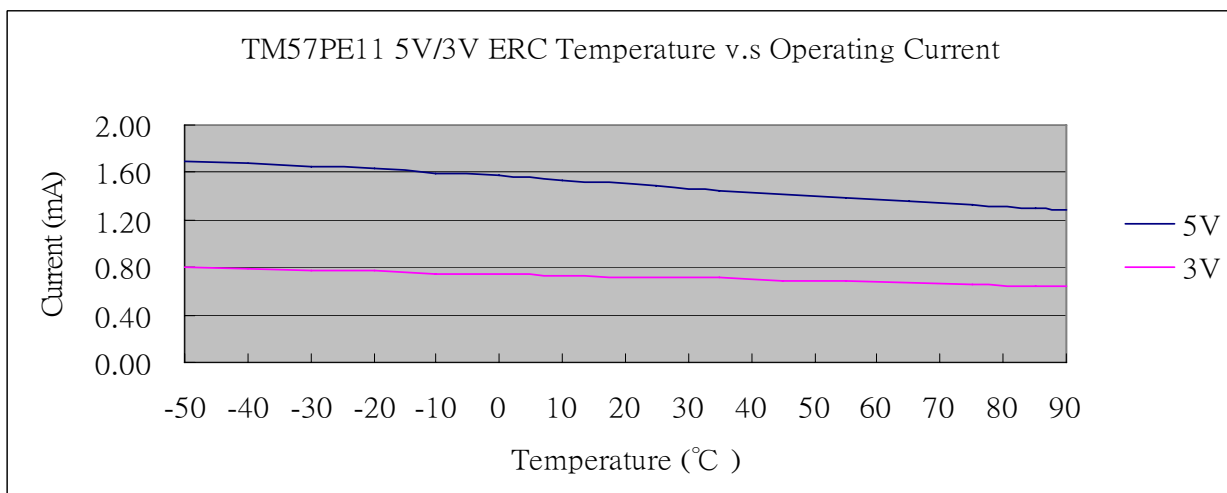
mA	2273KHz	2107KHz	1663KHz	1173KHz	769KHz	490KHz	343KHz	212KHz	97KHz	66KHz	51KHz	42KHz	31KHz
5V	1.55	1.48	1.33	1.17	1.04	0.96	0.92	0.89	0.85	0.84	0.83	0.83	0.83
3V	0.75	0.72	0.63	0.54	0.47	0.42	0.39	0.37	0.35	0.34	0.34	0.34	0.34



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

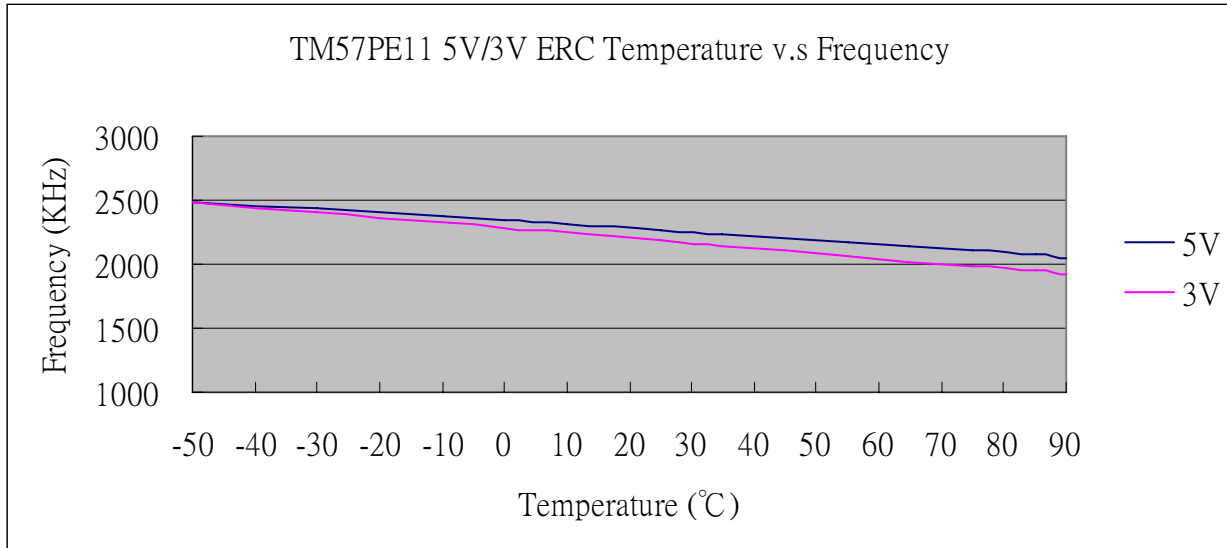
Test description: When the ERC (6.7KΩ/33PF) temperature is in the range of -50°C ~ 90°C, measure the operating current.

mA	-50°C	-40°C	-30°C	-20°C	-10°C	0°C	10°C	25°C	35°C	45°C	55°C	65°C	75°C	85°C	90°C
5V	1.70	1.68	1.65	1.63	1.59	1.57	1.54	1.49	1.45	1.42	1.39	1.36	1.33	1.30	1.28
3V	0.81	0.79	0.78	0.77	0.75	0.74	0.73	0.72	0.71	0.69	0.68	0.67	0.66	0.64	0.64



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

KHz	-50°C	-40°C	-30°C	-20°C	-10°C	0°C	10°C	25°C	35°C	45°C	55°C	65°C	75°C	85°C	90°C
5V	2487	2460	2433	2407	2380	2340	2320	2273	2240	2200	2173	2140	2107	2080	2053
3V	2487	2440	2400	2360	2327	2287	2247	2187	2147	2107	2060	2020	1989	1949	1927



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

μ A	-50°C	-40°C	-30°C	-20°C	-10°C	0°C	10°C	25°C	35°C	45°C	55°C	65°C	75°C	85°C	90°C
5V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
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	0.00	0.00	0.01

