



Important information on POH (power-on hours) for the OMAP44xx

The OMAP4430 is a typical state-of-the-art microcontroller. It packs enormous processing power into a small space. The space requirements of the circuitry are optimized through the use of POP (package-on-package) memory.

This generation of processors lets you benefit from the latest developments in consumer electronics. These modern controllers are used in smartphones and other mobile devices with high performance requirements. The high-volume production brings down your costs, and you have the advantage of sophisticated, high-density architectures.

Precisely because of their compact dimensions and high level of integration, these controllers are subjected to elevated thermal loads. Their design does not permit continuous operation over many years when all internal units are working at 100%.

The total period during which a controller can operate reliably depends on the thermal load. The term used for this period is POH (power-on hours). It refers to the (minimum) service life.

The POH value of a controller varies according to its use. The tables overleaf show an analysis of typical consumer applications (smartphone). For these scenarios the lifetimes are 5 years and 7 years.

The POH value depends to a high degree on how the different cores of the controller are used. There is no simple formula for calculating POH values.

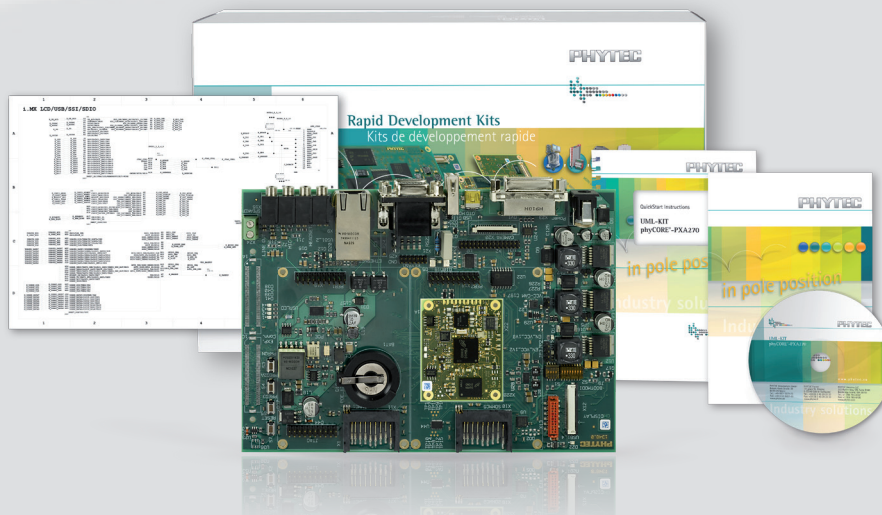
However, it is important to pay close attention to POH and plan your use of the controller in accordance with the technical conditions.

We will assist you in this and show you how to successfully use controllers of this kind in your industrial applications.

We can optimize software so that it automatically adjusts the clock frequency and voltage to the processing requirements of the application. In addition, we can send your typical application to Texas Instruments for calculation of the POH value for your particular scenario. The more accurate your description in terms of duration and use pattern, the more reliable the results of this calculation.

We will be glad to answer any questions.

Please contact our sales team.





Generic example⁽¹⁾⁽⁴⁾⁽⁵⁾ (operating time 5 years)

OMAP4430 Device	Case	Voltage (V) ⁽³⁾	Maximum Frequency (MHz)			T _j (°C) ⁽²⁾	POH (h)
			MPU	IVA	CORE		
OPAM4430 - 1000 MHz	43830 Hours (5 years)	< OPPNT	1000	266	400	93	2641
		< OPP100	600	266	400	48	1377
		< OPP50	300	133	200	59	6487
		< OPP50	98	133	200	30	1381
		Retention	-	-	-	25	31945
		Total					

(1) For other use cases, contact TI for evaluation to determine if they can be supported.

(2) T_j is the average operating junction temperature.

(3) See the operating condition addendum for values.

(4) With SmartReflex™ enabled.

(5) The power on hour (POH) analysis is based on a typical use case with the following parameters:

- ♦ The percentage (%) of activity by day for each application of the use case
- ♦ The MPU, IVA and CORE voltages and frequencies by application (ideally the use of vdd_mpu, vdd_iva_audio, or vdd_core OPPs)
- ♦ The average operating junction temperature
- ♦ SmartReflex™ (power optimization techniques) use or not

The above power on hour use case is based on a 5 year lifetime use profile for smartphones and other mobile devices.

Other use cases can apply for other devices in other fields and for a lifetime up to 5 years.

Practical example of mobile applications (operating time 7 years)

Phone use profile	Mode name	EFR (typical - with end-product ambient temperature at 25°C)			Worst case profile (with end-product ambient temperature up to 40°C)		
		Lifetime % active	KPOH	T _j [°C]	Lifetime % active	KPOH	T _j [°C]
1	Cellular or VOIP Voice	5.60 %	3.41	45	5.60 %	3.41	60
2	Browsing using HSDPA or WLAN - Active phase (note 4)	1.30 %	0.77	90	1.90 %	1.15	105
2 to	Browsing reading phase	2.90 %	1.79	65	4.40 %	2.68	80
3	Video playback (HD 16:9 > 30 fs)	1.20 %	0.75	75	3.10 %	1.92	90
3 to	Stereo Video playback (HD 16:9 > 24 fs)	1.20 %	0.75	80	3.10 %	1.92	95
4	Video recording (HD 16:9 > 30 fs)	0.40 %	0.26	80	1.00 %	0.64	95
4 to	Stereo Video recording (HD 16:9 > 30 fs)	0.40 %	0.26	85	1.00 %	0.64	100
5	Music playback	4.20 %	2.56	30	6.30 %	3.83	45
6	Messaging (SMS, email)	6.20 %	3.83	35	6.20 %	3.83	50
7	Navigation (AGPS)	0.90 %	0.55	75	0.90 %	0.55	90
8	Gaming (Online+local) (assume max thermal test case)	3.30 %	2	102	8.30 %	5.11	117
9	Standby	63.90 %	39.21	25	49.60 %	30.44	40
10	Still Image Capture	0.10 %	0.09	55	0.10 %	0.09	70
11	Fiddling (UI + other apps) + File Dn/Up	8.30 %	5.11	35	8.30 %	5.11	50
Total		100.00 %	61.32		100.00 %	61.32	