LDO BASICS

Quiescent Current 101

Quiescent Current Defined

- Quiescent is defined as “a state or period of inactivity or dormancy”
- Quiescent current (I_Q) is the current drawn by a system in standby mode with light or no load.

Quiescent Current ≠ Shutdown Current

- Shutdown current is the current drawn when a device is turned off but the battery is still connected to the system.

$$P_D = (V_{IN} - V_{OUT}) * I_{OUT} + (V_{IN} * I_Q)$$

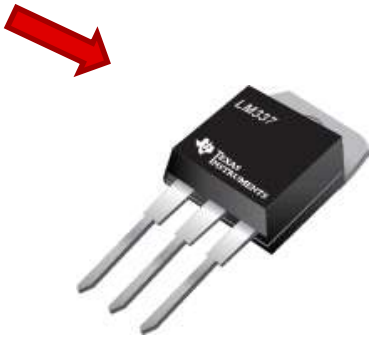
Example

V_{IN} = 4.2V | V_{OUT} = 1.8V | I_{OUT} = 200mA | I_Q = 50µA

$$P_D = (V_{IN} - V_{OUT}) * I_{OUT} + (V_{IN} * I_Q)$$

Active Mode	Standby Mode
$P_D = (4.2 - 1.8) * 0.2 + (4.2 * 0.00005)$ $P_D = 480.21\ mW$	$P_D = (4.2 - 1.8) * 0.0001 + (4.2 * 0.00005)$ $P_D = 0.45\ mW$

Space Constraints + Battery Life



Huge

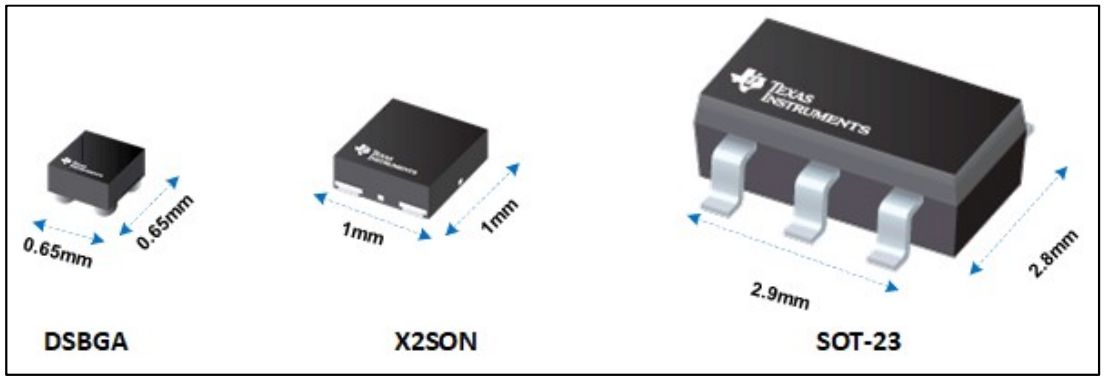
~10mm x 23mm

1mm x 1mm

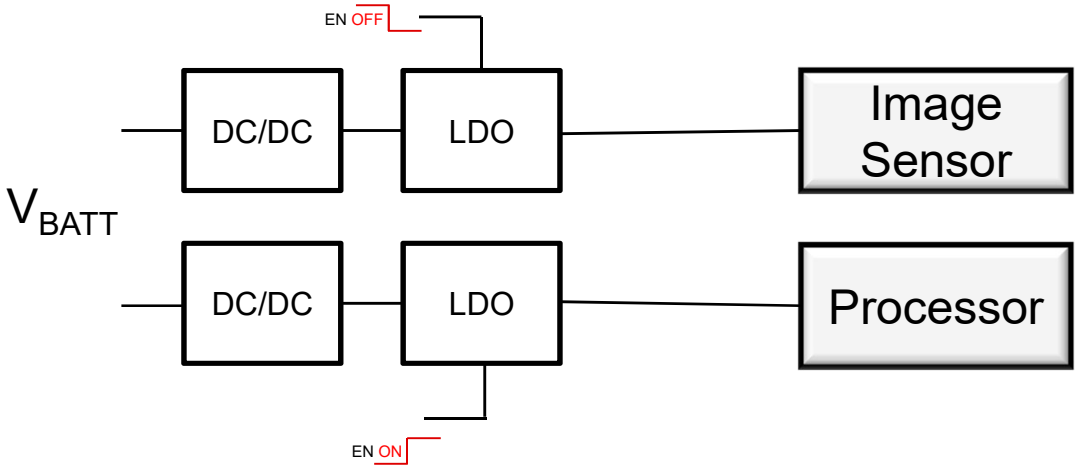
0.65mm x 0.65mm

Space Constraints + Battery Life

Device	I_Q
TPS7A05	1µA
TPS7A03	200nA
TPS7A02	25nA



Enabling your success



Thanks for watching!

For more information go to http://ti.com/ldo