Contents

1 Description

L5964 is a dual step-down switching regulator with internal power switches and a low drop-out linear/standby regulator. All the regulators have independent supply voltages, enables, power goods and thermal protections.

The switching regulators have selectable voltage supervisors and power goods, and selectable current limits. The LDO has power good and fixed current limitation.

The two DC-DC converters can work in free-run condition, with frequency selectable between two values, 250 kHz or 2 MHz, or synchronize themselves to an external clock (SYNCIN pin). They are 180° out of phase, while the synchronization output signal (SYNCOUT pin) is 90° out of phase with the first regulator. The phase shift simplifies the use of two ICs in the same application (4 DC/DCs regulators).

The high operating frequency allowed by the synchronization input helps to reduce AM and FM interferences and grants the use of small and low cost inductors and capacitors.

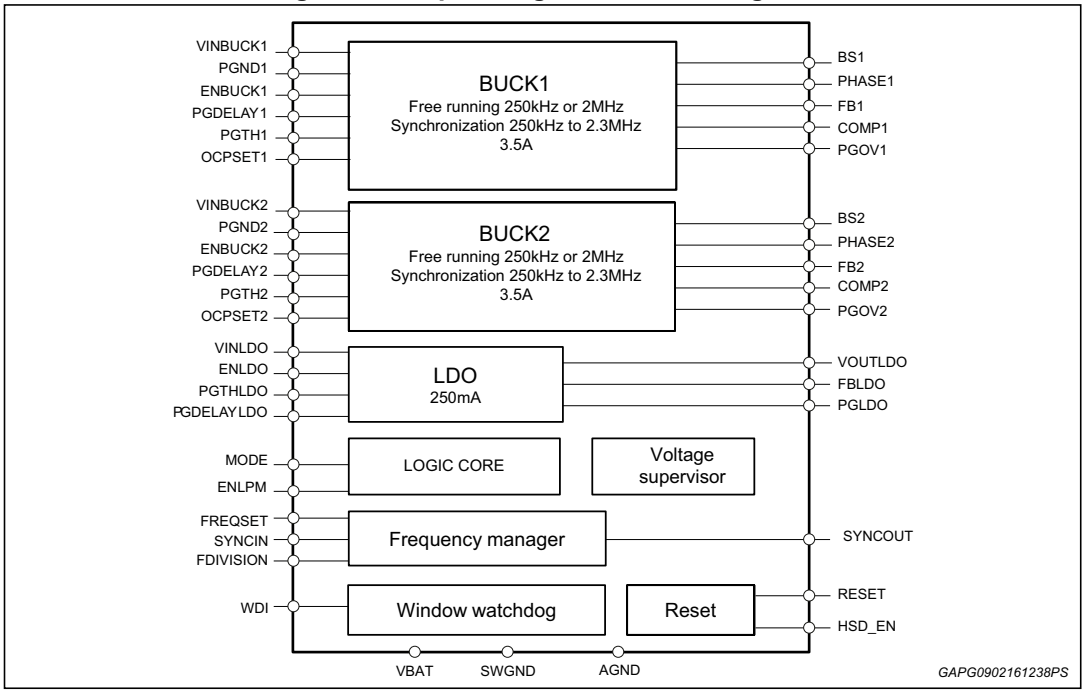
The two switching regulators can be used in parallel and increase the output current capability up to 7 A.

The L5964 can manage the microcontroller supply. A configurable reset output and a configurable watchdog input are available.

This IC finds application in the automotive segment, where load dump protection and wide input voltage range are mandatory. The total quiescent current, when both DC/DCs and LDO are disabled, is less than 10 µA.

The product is available in two different packages. A slug down package, QFN48, able to dissipate on the PCB. An exposed pad up package, LQFP64, when the power requirement is higher and an external heatsink is needed.

Figure 1. Simplified, general block diagram



2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK® is an ST trademark.

2.1 LQFP64 (10x10x1.4 mm exp. pad up) package information

Figure 2. LQFP64 (10x10x1.4 mm exp. pad up) package outline

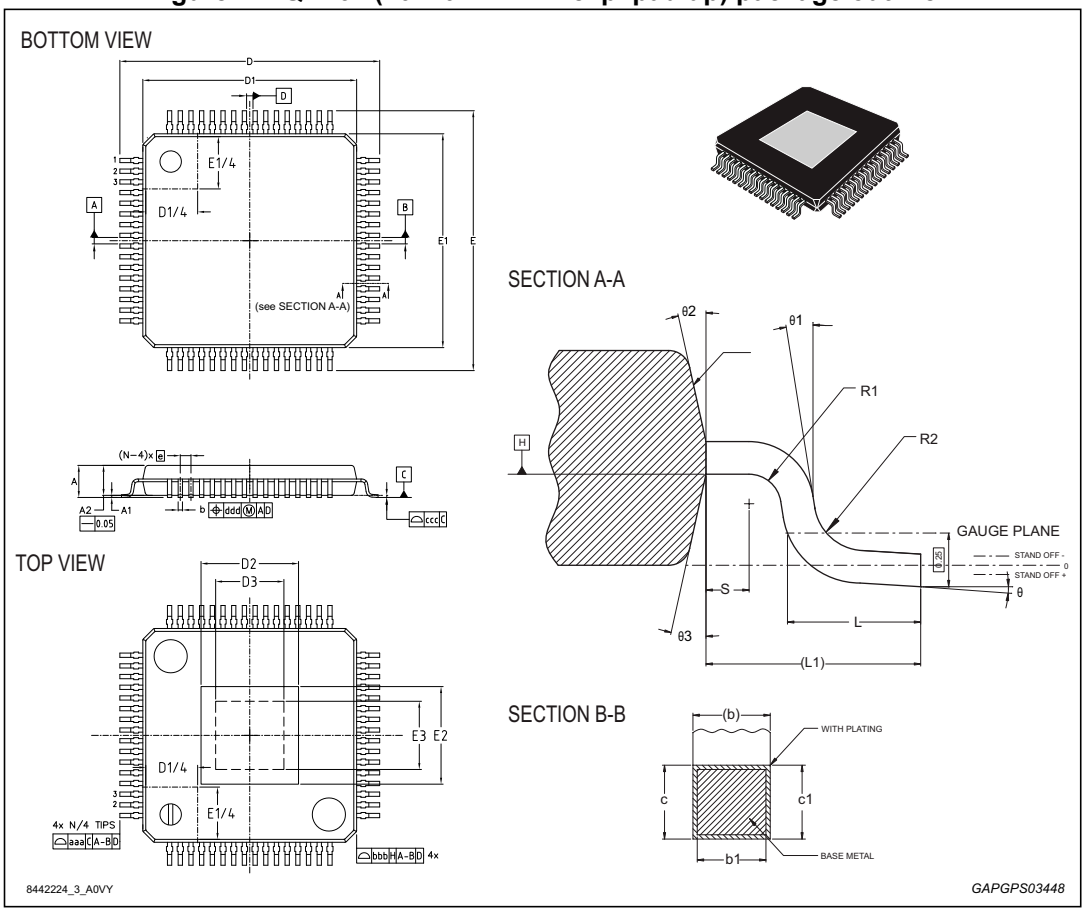


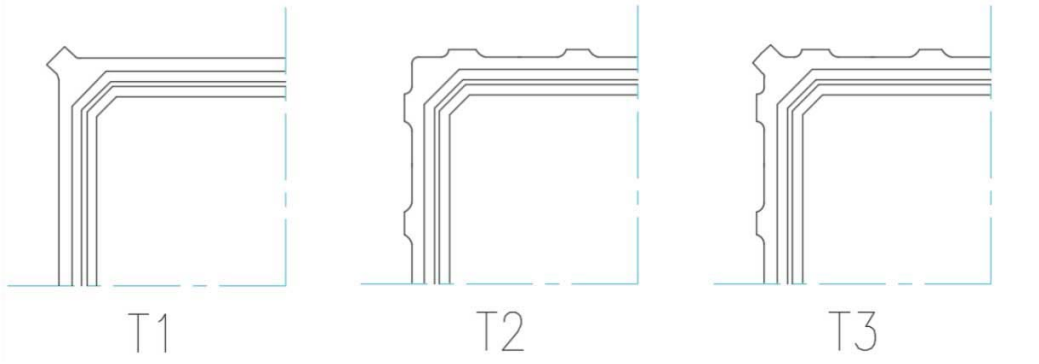
Table 2. LQFP64 (10x10x1.4 mm exp. pad up) package mechanical data

Symbol	Dimensions in mm		
	Min.	Typ.	Max.
Θ	0°	3.5°	6°
Θ1	0°	9°	12°
Θ2	11°	12°	13°
Θ3	11°	12°	13°
A	-	-	1.49
A1	-0.04	-	0.04
A2	1.35	1.4	1.45
b	-	-	0.27
b1	0.17	0.20	0.23
c	0.09	-	0.20
c1	0.09	0.127	0.16
D	12.00 BSC		
D1(1) (2)	10.00 BSC		
D2	**See VARIATIONS**		
e	0.50 BSC		
E	12.00 BSC		
E1(1) (2)	10.00 BSC		
E2	**See VARIATIONS**		
L	0.45	0.60	0.75
L1	1.00 REF		
N	-	64	-
R1	0.08	-	-
R2	0.08	-	0.20
S	0.20	-	-
Tolerance of form and position			
aaa	-	0.20	-
bbb	-	0.20	-
ccc	-	0.08	-
ddd	-	0.08	-

Table 2. LQFP64 (10x10x1.4 mm exp. pad up) package mechanical data (continued)

Symbol	Dimensions in mm		
	Min.	Typ.	Max.
VARIATIONS			
Pad option 6.0x6.0 (T1-T3)(3)			
D2	-	-	6.61
E2	-	-	6.61
D3	4.8	-	-
E3	4.8	-	-

1. Dimensions D1 and E1 do not include mold flash or protrusions.
   Allowable mold flash or protrusion is “0.25 mm” per side.
2. The Top package body size may be smaller than the bottom package size by much as 0.15 mm.
3. Number, dimensions and position of shown groves are for reference only:



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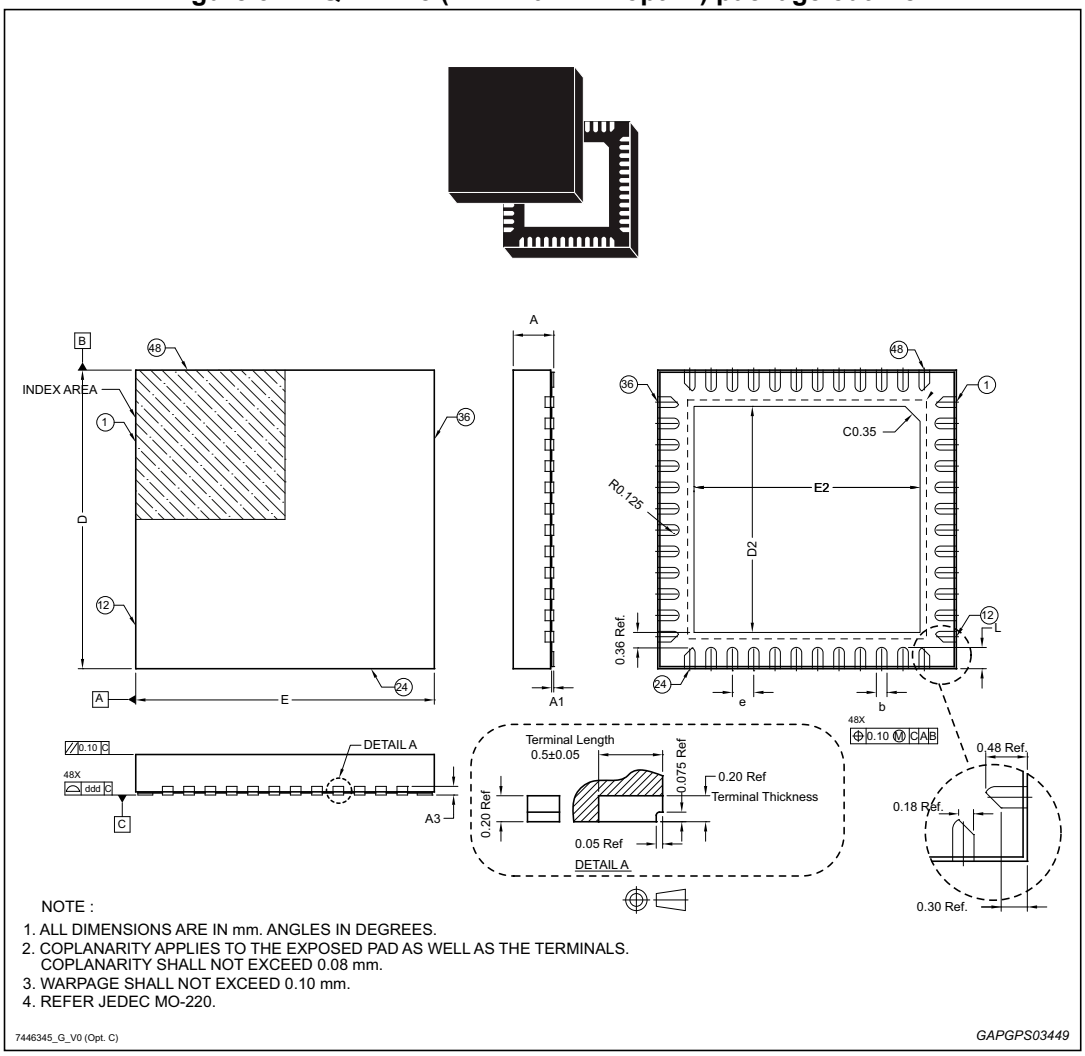
2.2 VFQFPN-48 (7x7x1.0 mm - opt. D) package information

Figure 3. VFQFPN-48 (7x7x1.0 mm - opt. D) package outline



NOTE :

1. ALL DIMENSIONS ARE IN mm. ANGLES IN DEGREES.
2. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS. COPLANARITY SHALL NOT EXCEED 0.08 mm.
3. WARPAGE SHALL NOT EXCEED 0.10 mm.
4. REFER JEDEC MO-220.

7446345_G_V0 (Opt. C)

GAPGPS03449

Table 3. VFQFPN-48 (7x7x1.0 mm - opt. D) package mechanical data

Ref	Dimensions					
	Millimeters			Inches[1]		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.85	0.95	1.05	0.0335	0.0374	0.0413
A1	-	-	0.05	-	-	0.0020
A2	-	0.75	-	-	0.0295	-
A3	-	0.200	-	-	0.0079	-
b	0.15	0.25	0.35	0.0059	0.0098	0.0138
D	6.80	7.00	7.15	0.2697	0.2756	0.2815
D2	5.15	5.30	5.45	0.2028	0.2087	0.2146
E	6.85	7.00	7.15	0.2697	0.2756	0.2815
E2	5.15	5.30	5.45	0.2028	0.2087	0.2146
e	0.45	0.50	0.55	0.0177	0.0197	0.0217
L	0.45	0.50	0.55	0.0177	0.0197	0.0217
ddd	-	-	0.08	-	-	0.0031

1. Values in inches are converted from mm and rounded to 4 decimal digits.

3 Revision history

Table 4. Document revision history

Date	Revision	Changes
10-Feb-2016	1	Initial release.
21-Aug-2017	2	Updated: – Added in the *Features* 'AEC-Q100 qualified'. – *Section 2.1: LQFP64 (10x10x1.4 mm exp. pad up) package information.*