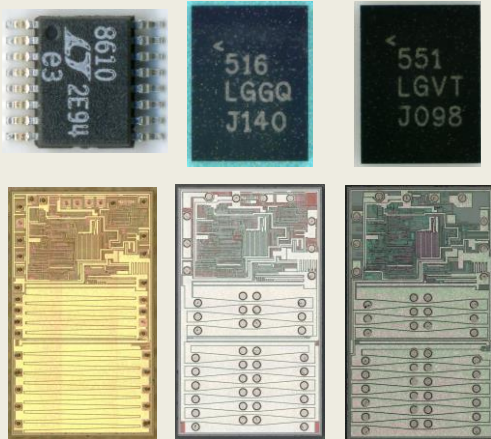


## LT8610/14/40 DC-DC CONVERTER IC STRUCTURE ANALYSIS (Techniques to reduce conduction losses)

**October 5, 2016.** This detailed structure analysis report examines how Linear Technology reduces conduction losses in the LT86 series third generation DC-DC converters. The LT8610/14/40 family improves ON-resistance ( $R_{ON}$ ) of the MOSFET switches without increasing their die area. Each elements contributing to conduction losses (transistor, metallization, package) are identified and quantitatively analyzed in this 48-page report. The analysis of the LDMOS transistor layout and its physical construction highlights process/technology enhancements deployed in this product.



LT8610

LT8614

LT8640

Items		DC-DC converter IC		
		LT8610	LT8614	LT8640
Product name		LT8610	LT8614	LT8640
Product introduction		Yr2010	Yr2012	Yr2013
Input voltage	V	Year3.4~42		
Max output current	A	2.5	4	5
$R_{ON}$ (High-Side) Typ.	m $\Omega$	120	85	67
$R_{ON}$ (Low-Side) Typ.	m $\Omega$	65	40	28
Max operation frequency	MHz	2.2	3	3
Package		MSOP	UDC (QFN)	UDC (QFN)

Comparison table

Techniques contributing to reduction of conduction losses:

1. QFN package (Flip-chip, solder bumps)
2. Top metal layout
3. Bumps over transistor active areas
4. Reduction of specific resistance ( $R_{ON,SP}$ )(\*) of LDMOS

(\*)  $R_{ON,SP}=R_{ON}A$

**Priced to sell at \$2,500**

Note: The LT8640 has dual mode operation: Spread spectrum and Burst Mode. LETC is currently preparing circuit analysis report focusing on the implementation of spread spectrum mode.

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# Table of Contents

	<b>Page</b>
Analysis purpose	3
Device summary	4
Executive summary	5
Comparison (LT8610/14/40) of $R_{ON}$ elements of low side LDMOS	6
LT8460 conduction loss analysis	
Low-side LDMOS	7
High-side LDMOS	8
Cross-section comparison (LT8610/14/40)	9
LDMOS $R_{ON}$ analysis results	10
Device structure analysis summary	11
Package comparison	12
Die plane analysis	13
Device structure detail	
LT8610	15
LT8614	23
LT8640	31
LT8640 package cross-section	42
Appendix: $R_{ON}$ model	47

