

3. Calculations and Equations.

The purpose of this section is to calculate power dissipation on the IC per HCSL output pair.

HCSL output driver circuit and termination are shown in *Figure 7*.

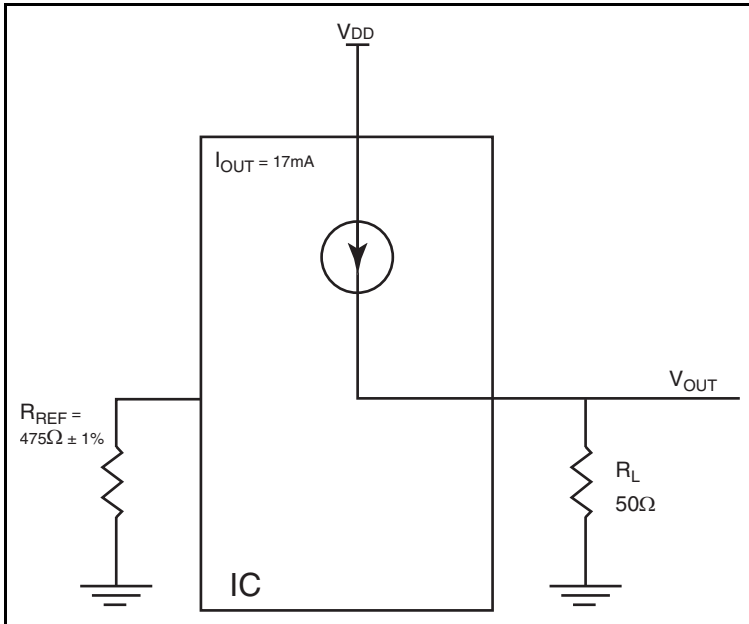


Figure 7. HCSL Driver Circuit and Termination

HCSL is a current steering output which sources a maximum of 17mA of current per output. To calculate worst case on-chip power dissipation, use the following equations which assume a 50Ω load to ground.

The highest power dissipation occurs when V_{DD_MAX} .

$$\text{Power} = (V_{DD_MAX} - V_{OUT}) * I_{OUT}$$

$$\text{since } V_{OUT} = I_{OUT} * R_L$$

$$\text{Power} = (V_{DD_MAX} - I_{OUT} * R_L) * I_{OUT}$$

$$= (3.465V - 17mA * 50\Omega) * 17mA$$

Total Power Dissipation per output pair = **44.5mW**

Reliability Information

Table 9. θ_{JA} vs. Air Flow Table for a 48 Lead VFQFN

θ_{JA} vs. Air Flow			
Meters per Second	0	1	2.5
Multi-Layer PCB, JEDEC Standard Test Boards	30.5°C/W	26.7°C/W	23.9°C/W

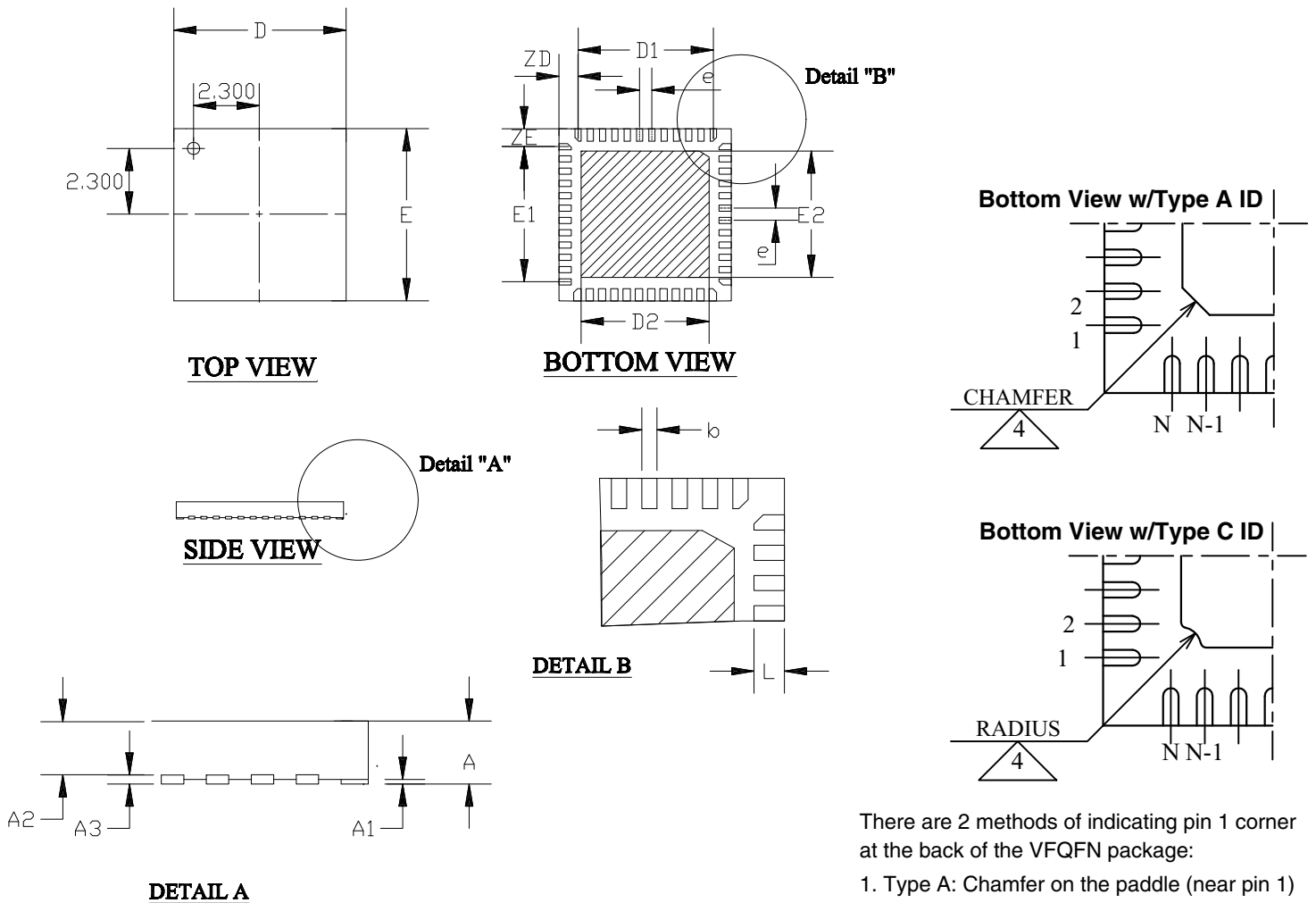
Transistor Count

The transistor count for 8413S06 is: 10,307

Package Outline and Package Dimensions

Package Outline - K Suffix for 48 Lead VFQFN

FOR REFERENCE ONLY



There are 2 methods of indicating pin 1 corner at the back of the VFQFN package:

1. Type A: Chamfer on the paddle (near pin 1)
2. Type C: Mouse bite on the paddle (near pin 1)

Table 10. Package Dimensions for 48 Lead VFQFN

All Dimensions in Millimeters			
Symbol	Minimum	Nominal	Maximum
N		48	
A		0.8	0.9
A1	0	0.02	0.05
A3		0.2 Ref.	
b	0.18	0.25	0.30
D & E		7.00 Basic	
D1 & E1		5.50 Basic	
D2 & E2	5.50	5.65	5.80
e		0.50 Basic	
R		0.20~0.25	
ZD & ZE		0.75 Basic	
L	0.35	0.40	0.45

Reference Document: IDT Drawing #PSC-4203

Ordering Information

Table 11. Ordering Information

Part/Order Number	Marking	Package	Shipping Packaging	Temperature
8413S06BKILF	ICS8413S06BIL	48 Lead VFQFN, Lead-Free	Tray	-40°C to 85°C
8413S06BKILFT	ICS8413S06BIL	48 Lead VFQFN, Lead-Free	Tape & Reel	-40°C to 85°C

NOTE: Parts that are ordered with a "LF" suffix to the part number are the Pb-Free configuration and are RoHS compliant.

Revision History Sheet

Rev	Table	Page	Description of Change	Date
B	T1	1	New pin assignment format - no changes to pins.	2/03/15
		2	Corrected block diagram.	
		3	Pin Description Table - corrected pin 39 (nMR) description. Updated header/footer throughout the datasheet.	
C		2	Corrected QG output in block diagram from differential output to single-ended output.	3/06/15



Corporate Headquarters
6024 Silver Creek Valley Road
San Jose, CA 95138 USA

Sales
1-800-345-7015 or 408-284-8200
Fax: 408-284-2775
www.IDT.com

Tech Support
email: clocks@idt.com

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