

DIO1466

Data/Audio Low-Voltage Dual DPDT Analog Switch

Features

- Switch Type: DPDT(2X)
- Input Type: Data/Audio Switch
- Voltage Operation: 1.65V to 5.25V
- Low On Resistance: 2.7Ω @ 5.0V V_{CC}
- Bandwidth: 170MHz
- 16pF C_{ON} and 6.0pF C_{OFF} @1MHz
- Excellent On Resistance Matching
- Low Total Harmonic Distortion (THD)
- Low power consumption
- Green Packaged: 16-Lead QFN1.8*2.6 and 16-Lead QFN3*3 and 16-Lead QFN2.5*2.5
- 8kV HBM ESD

Descriptions

The DIO1466 is a dual Double-Pole, Double-Throw (DPDT) analog switch. DIO1466 operates from a single 1.65V to 5.25V supply and features an ultra-low on resistance of 2.7Ω at a 5.0V supply and T_A=25°C. This device is fabricated with sub-micron CMOS technology to achieve fast switching speeds and is designed for break-before-make operation.

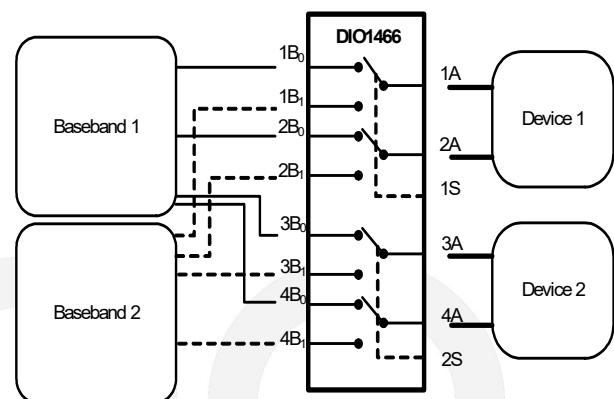
DIO1466 features very low quiescent current even when the control voltage is lower than the V_{CC} supply. This allows mobile handset applications direct interface with the baseband processor general-purpose I/Os.

DIO1466 provides packages with Green 16-lead QFN1.8*2.6 and 16-lead QFN3*3 and 16-lead QFN2.5*2.5.

Applications

- Cell-Phone/PDA
- MP3/MP4/PMP
- Portable Instrumentation
- Battery Powered Communications
- Computer Peripherals

Block Diagram



Ordering Information

Order Part Number	Top Marking		T _A	Package	
DIO1466LN16	D14	Green	-40 to 85°C	QFN1.8*2.6-16	Tape & Reel, 3000
DIO1466CL16	D1466	Green	-40 to 85°C	QFN3*3-16	Tape & Reel, 5000
DIO1466QL16	D1466	Green	-40 to 85°C	QFN2.5*2.5-16	Tape & Reel, 3000

Pin Assignment

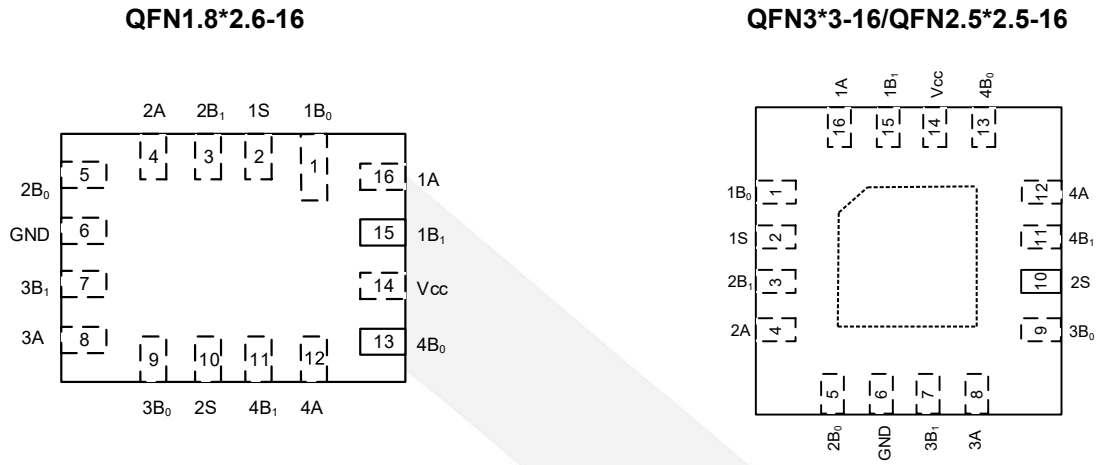


Figure 1 Top View

Pin Descriptions

Pin Name	Description
nB ₀ /nB ₁	Data / Audio Port
1S/2S	Switch Select
nA	Data/Audio Common Port
V _{cc} / GND	Power

Truth Table

1S	2S	Function
L	-	1B ₀ =1A & 2B ₀ = 2A
H	-	1B ₁ =1A & 2B ₁ =2A
-	L	3B ₀ =3A & 4B ₀ =4A
-	H	3B ₁ =3A & 4B ₁ =4A



DIO1466

Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Rating" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Symbol	Parameter	Min.	Max.	Unit
V _{CC}	Supply Voltage	-0.5	5.5	V
V _S	Switch Voltage	-0.5	V _{CC} +0.3	V
V _{IN}	DC input I/O Voltage	-0.5	5.0	V
I _{IK}	DC input Diode current	-50		mA
I _{OUT}	DC output current		50	mA
T _{STG}	Storage Temperature	-65	150	°C
ESD	HBM, JEDEC: JESD22-A114		8	kV

Recommend Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended Operating conditions are specified to ensure optimal performance to the datasheet specifications. DIOO does not Recommend exceeding them or designing to Absolute Maximum Ratings.

Symbol	Parameter	Min.	Max.	Unit
V _{CC}	Supply voltage	1.65	5.25	V
V _{IN}	Control input voltage (1S,2S)	0	V _{CC}	V
V _S	Switch I/O voltage	0	V _{CC}	V
T _A	Operating Temperature	-40	85	°C



DIO1466

DC Electrical Characteristics

All typical value is at 25°C unless otherwise specified.

Symbol	Parameter	Conditions	V _{CC} / V	Temp. (°C)	Min.	Typ.	Max.	Unit
V _{IH}	Input voltage high		4.3	-40 to 85°C	1.55			V
V _{IL}	Input voltage low		4.3	-40 to 85°C			0.7	V
I _{IN}	Control input leakage	V _{SW} =0 to V _{CC}	4.3	25°C		-0.5	0.5	nA
I _{NC(OFF)} I _{NC(OFF)}	Off Leakage Current of Port nB ₀ and nB ₁	nB=0.3V, V _{CC} -0.3V or Floating	1.95 to 4.3	25°C	-10		10	nA
I _{A(ON)}	On Leakage Current of Port A	nB=0.3V, V _{CC} -0.3V or Floating	1.95 to 4.3	25°C	-10		10	nA
I _{CC}	Quiescent supply current	V _{IN} =0V to V _{CC} , I _{OUT} =0V	4.3	25°C	-100		100	nA
R _{ON}	Switch on Resistance	I _{OUT} =100mA, nB ₀ , nB ₁ =0, 0.7, 1.2, V _{CC}	2.7	-40 to 85°C			4.5	Ω
			5.0	25°C			2.7	Ω
ΔR _{ON}	Delta On Resistance	I _{OUT} =100mA, nB ₀ , nB ₁ =0.7V	2.7	-40 to 85°C			0.14	Ω
R _{FLAT(ON)}	On Resistance Flatness	I _{OUT} =100mA, nB ₀ , nB ₁ =0 to V _{CC}	2.7	-40 to 85°C			1.8	Ω
I _{CC(T)}	Increase in I _{CC} Current Per Control Voltage and V _{CC}	V _{IN} =1.8V,	4.3	25°C		7.0	12.0	uA
		V _{IN} =2.6V	4.3	25°C		3.0	6.0	uA



DIO1466

AC Electrical Characteristics

All typical value are for $V_{CC}=3.3V$ at $25^{\circ}C$ unless otherwise specified.

Symbol	Parameter	Conditions	$V_{CC}(V)$	Temp($^{\circ}C$)	Min.	Typ.	Max.	Unit
t_{ON}	Turn-On time	$R_L=50\Omega$, $C_L=35pF$, nB_0 , or $nB_1=1.5V$	2.7 to 3.6	full			60	ns
t_{OFF}	Turn-Off time	$R_L=50\Omega$, $C_L=35pF$, nB_0 , or $nB_1=1.5V$	2.7 to 3.6	full			50	ns
t_{PD}	Propagation delay	$R_L=50\Omega$, $C_L=35pF$	3.3	$25^{\circ}C$		0.25		ns
t_{BBM}	Break-Before-Make	$R_L=50\Omega$, $C_L=35pF$, nB_0 , or $nB_1=1.5V$	2.7 to 3.6	$25^{\circ}C$		12		ns
OIRR	.Off Isolation	$R_L=50\Omega$, $f=100KHz$, $C_L=5pF$	2.7 to 3.6	$25^{\circ}C$		-75		dB
Xtalk	Non-Adjacent Channel Crosstalk	$R_L=50\Omega$, $f=100KHz$	2.7 to 3.6	$25^{\circ}C$		-75		dB
BW	-3dB bandwidth	$R_L=50\Omega$, $C_L=0pF$,	2.3 to 4.3	$25^{\circ}C$		170		MHz
THD	Total Harmonic Distortion	$R_L=600\Omega$, $V_{IN}=2V_{pp}$ $f=20$ to $20kHz$	2.7 to 3.6	$25^{\circ}C$		1		%

Capacitance

All typical value is at $25^{\circ}C$ unless otherwise specified.

Symbol	Parameter	Conditions	V_{CC}	Min.	Typ.	Max.	Unit
C_{IN}	Control Pin Input Capacitance		0		1.3		pF
C_{OFF}	B Port Off Capacitance	$f=1MHz$	3.3		6.0		pF
		$f=240MHz$	3.3		6.0		pF
C_{ON}	A Port Off Capacitance	$f=1MHz$	3.3		21.0		pF
		$f=240MHz$	3.3		16.0		pF

Specifications subject to change without notice.

Test Diagrams

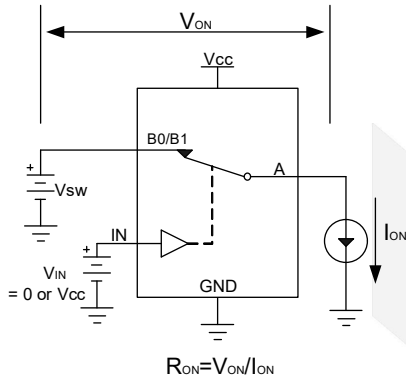


Figure 2. Switch on resistor

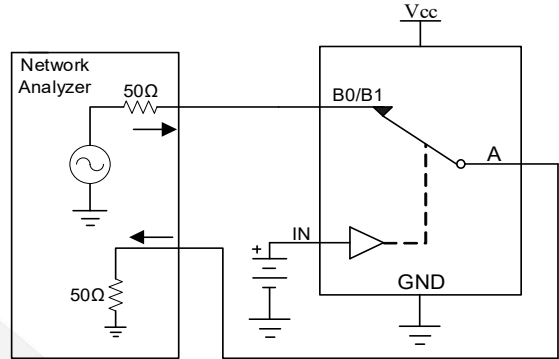


Figure 3. Bandwidth

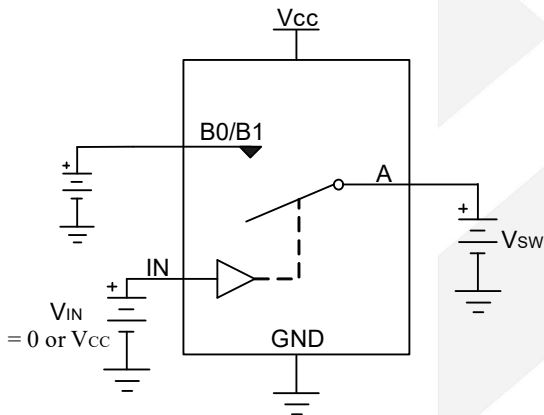


Figure 4. Switch Off Leakage

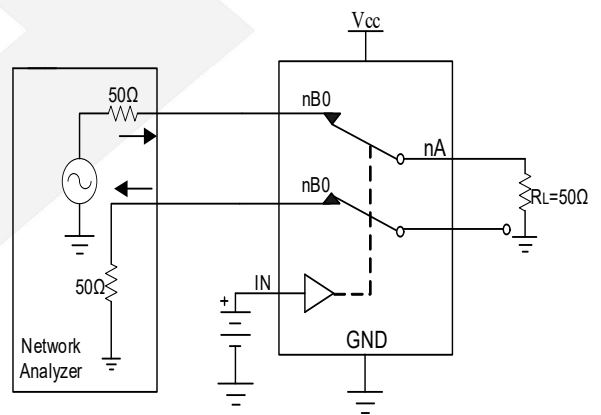


Figure 5. Channel-to-channel crosstalk

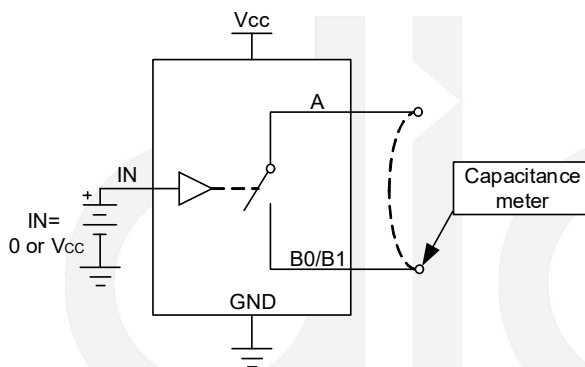


Figure 6. On/off Capacitance test

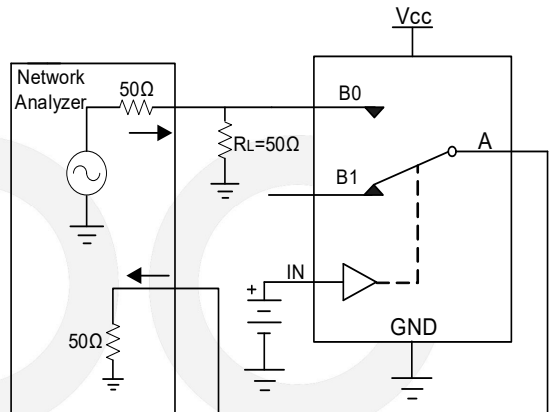


Figure 7. Off-isolation

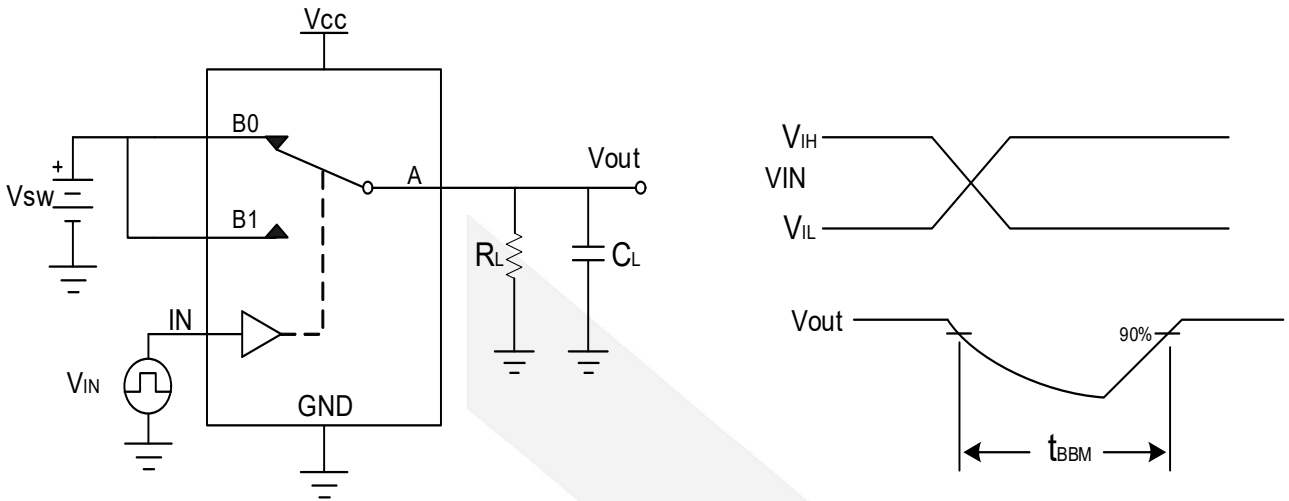


Figure 8. Break-Before-Make

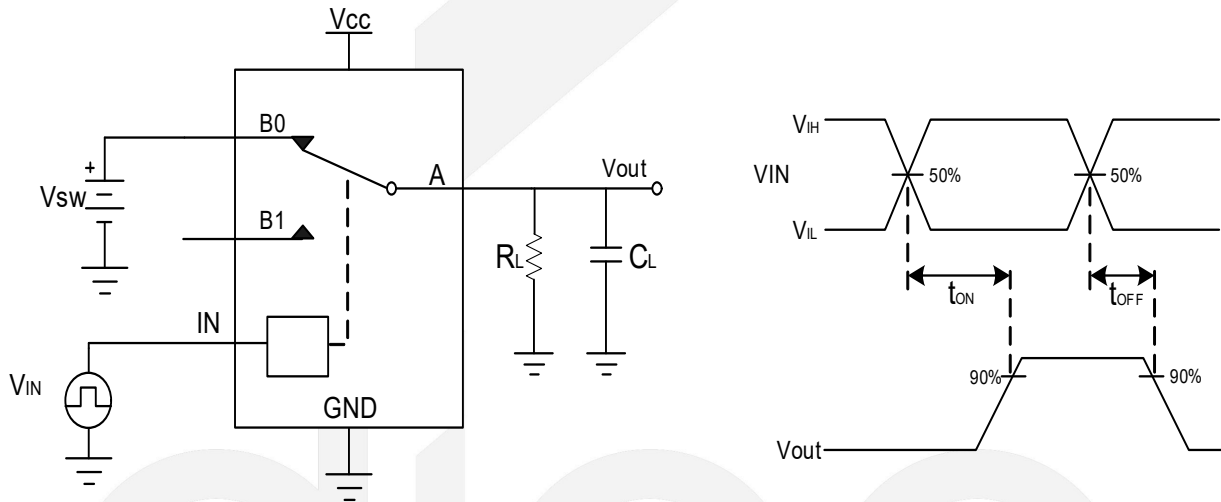
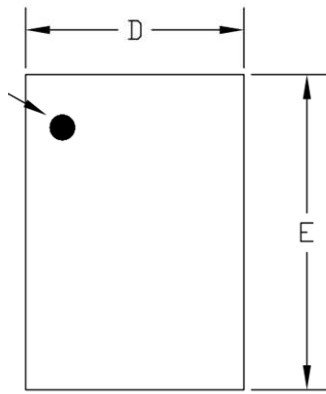
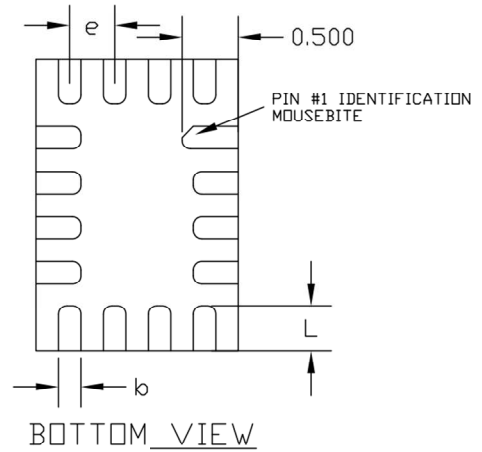


Figure 9. Turn-On/Turn-Off

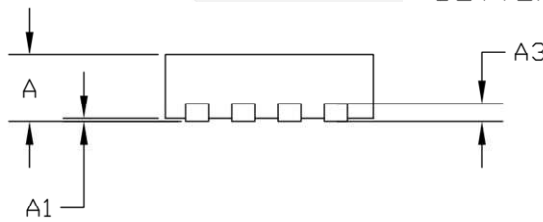
Physical Dimensions: QFN1.8*2.6-16



TOP VIEW



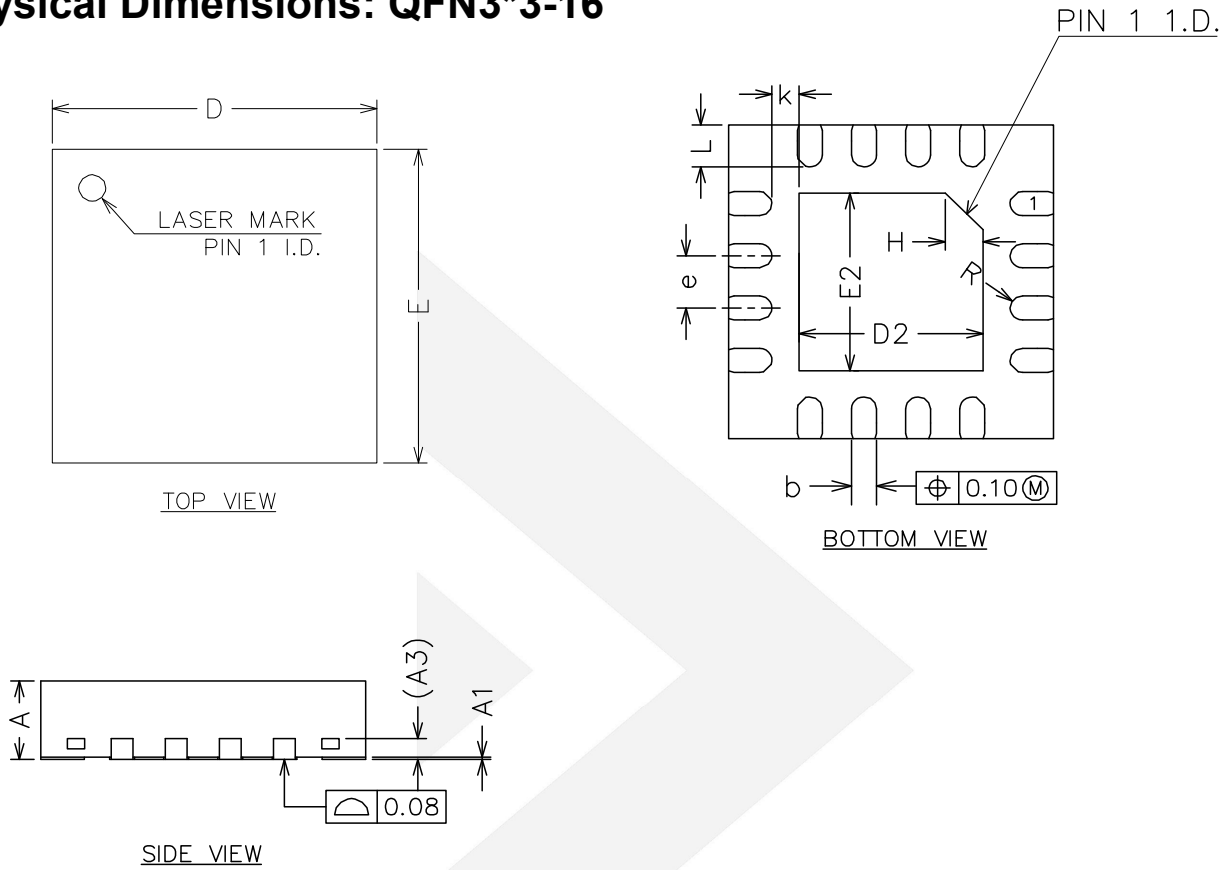
BOTTOM VIEW



SIDE VIEW

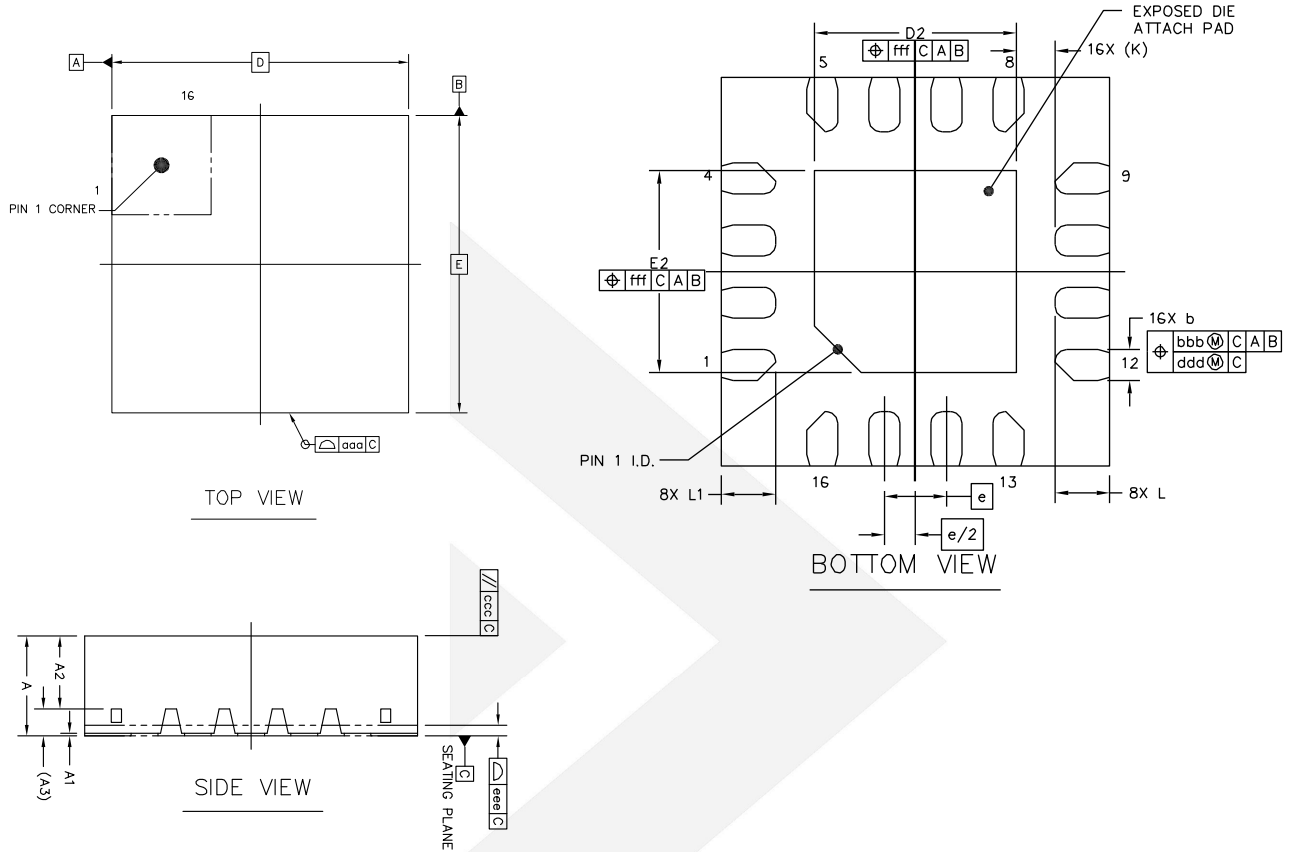
COMMON DIMENSIONS(MM)			
PKG.	UT:ULTRA THIN		
	MIN	NOM	MAX
REF			
A	0.50	0.55	0.60
A1	0.00	--	0.05
A3	0.15REF.		
D	1.75	1.80	1.85
E	2.55	2.60	2.65
L	0.35	0.40	0.45
b	0.15	0.20	0.25
e	0.40BSC		

Physical Dimensions: QFN3*3-16



COMMON DIMENSIONS(MM)			
SYMBOL	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A3	0.20REF		
b	0.18	0.23	0.28
D	2.90	3.00	3.10
E	2.90	3.00	3.10
D2	1.60	1.70	1.80
E2	1.60	1.70	1.80
e	0.40	0.50	0.60
H	0.35REF		
K	0.15	0.25	0.35
L	0.30	0.40	0.50
R	0.09	-	-

Physical Dimensions: QFN2.5*2.5-16



COMMON DIMENSIONS(MM)			
SYMBOL	MIN	NOM	MAX
A	0.7	0.75	0.8
A1	0	0.02	0.05
A2	-	0.55	-
A3	0.203REF		
b	0.15	0.2	0.25
D	2.5BCS		
E	2.5BCS		
e	0.4BCS		
D2	1.2	1.3	1.4
E2	1.2	1.3	1.4
L	0.3	0.35	0.4
L1	0.25	0.35	0.45
K	0.25REF		
aaa	0.1		
ccc	0.1		
eee	0.05		
bbb	0.07		
ddd	0.05		
fff	0.1		

CONTACT US

Dioo is a professional design and sales corporation for high-quality and performance analog semiconductors. The company focuses on industry markets, such as, cell phone, handheld products, laptop, and medical equipment and so on. Dioo's product families include analog signal processing and amplifying, LED drivers and charger IC. Go to <http://www.dioo.com> for a complete list of Dioo product families.

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