



BCT4899

5Ω, High Speed, Low Voltage Dual DPDT Analog Switch

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GENERAL DESCRIPTION

The BCT4899 is a high-speed, low-voltage, dual-independent double-pole double-throw (DPDT) COMS analog switch that is designed to operate from a single 1.8V to 5.5V power supply. It features high-bandwidth (500MHz) and low on-resistance (5Ω TYP).

The BCT4899 is configured as a dual double-pole double-throw(DPDT) device with two logic control inputs that control two multiplexer/demultiplexer each. The configuration can also be used as a dual differential 2-to-1 multiplexer/demultiplexer.

BCT4899 is available in Green TQFN-3x3-16L, TQFN-2.5x2.5-16L and UTQFN1.8x2.6-16L.

FEATURES

- Low Voltage Operation: 1.8V to 5.5V
- On-Resistance: 5Ω(TYP)
- -3dB Bandwidth: 500MHz
- Rail-to-Rail Input and Output Operation
- High Off-Isolation: -55dB@10MHz
- Low Crosstalk: -60dB@10MHz
- Low Power Consumption(<0.01uW)
- -40°C to +85°C Operating Temperature Range

APPLICATIONS

- Communication Systems
- Portable Instrumentation
- Audio and Video Switching
- PCMCIA Cards
- Computer Peripherals
- Modems
- PDAs

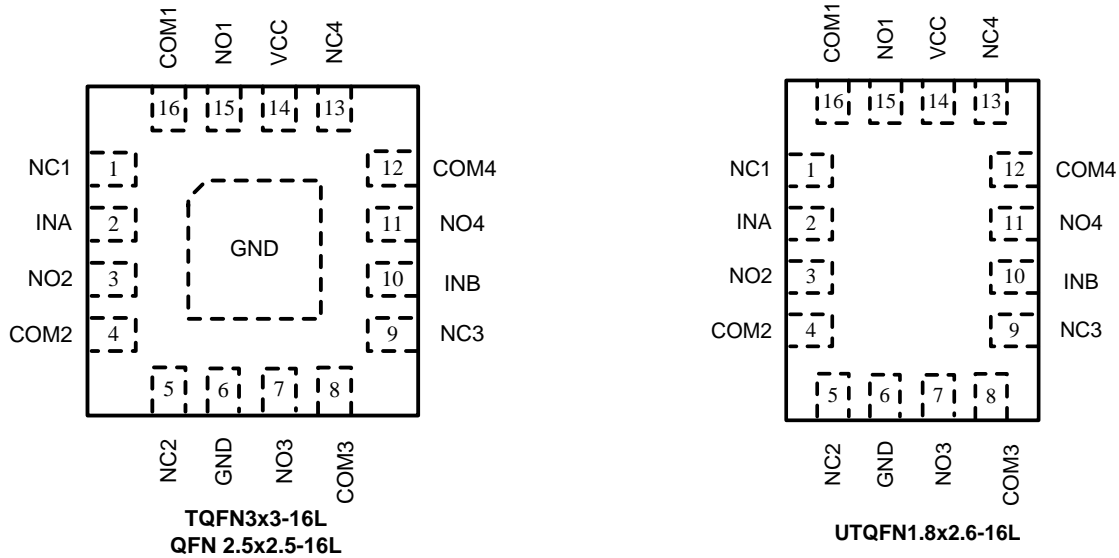
ORDERING INFORMATION

Order Number	Package Type	Temperature Range	Marking	QTY/Reel
BCT4899ETE-TR	TQFN3x3-16L	-40°C to +85°C	4899 XXXXX	3000
BCT4899EGE-TR	QFN 2.5x2.5-16L	-40°C to +85°C	4899 XXXXX	3000
BCT4899EFE-TR	UTQFN1.8x2.6-16L	-40°C to +85°C	4899 XXXXX	3000

Mark Note:

1. "4899" in Marking is Product code
2. "XXXXX" in Marking will be appeared as the batch code.

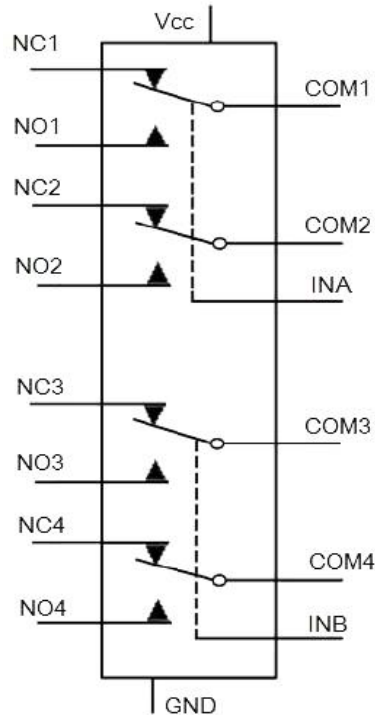
PIN CONFIGURATION (Top View)



PIN DESCRIPTIONS

Pin	Name	Function
1	NC1	Normally Closed Terminal Switch 1
2	INA	Select Input, control switch 1 and switch 2
3	NO2	Normally Open Terminal Switch 2
4	COM2	Common Terminal Switch 2
5	NC2	Normally Closed Terminal Switch 2
6	GND	Ground
7	NO3	Normally Open Terminal Switch 3
8	COM3	Common Terminal Switch 3
9	NC3	Normally Closed Terminal Switch 3
10	INB	Select Input, control switch 3 and switch 4
11	NO4	Normally Open Terminal Switch 4
12	COM4	Common Terminal Switch 4
13	NC4	Normally Closed Terminal Switch 4
14	VCC	Positive Power Supply
15	NO1	Normally Open Terminal Switch 1
16	COM1	Common Terminal Switch 1

LOGIC DIAGRAM



TRUTH TABLE

INA	SWITCH STATE
0	NC1 = COM1, NC2 = COM2
1	NO1 = COM1, NO2 = COM2

INB	SWITCH STATE
0	NC3 = COM3, NC4 = COM4
1	NO3 = COM3, NO4 = COM4



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ABSOLUTE MAXIMUM RATINGS

VCC, INA, INB to GND.....-0.3V to +6.0V
All Other Pins to GND (Note 1).....-0.3V to (VCC + 0.3V)
Continuous Current (NOx, NCx, COM_)..... ±100mA
Operating Temperature Range.....-40°C to +85°C
Storage Temperature Range.....-65°C to +150°C
Junction Temperature.....+150°C
Lead Temperature (soldering, 10s).....+260°C

CAUTION

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. Broadchip recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

Broadchip reserves the right to make any change in circuit design, specification or other related things if necessary without notice at any time. Please contact Broadchip sales office to get the latest datasheet.

RECOMMENDED OPERATING CONDITONS

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.

Symbol	Parameter	Min.	Max.	Unit
V _{CC}	Supply Voltage	1.8	5.5	V
V _{CTRL}	Control Input Voltage(INA,INB) ⁽²⁾	0	VCC	V
V _{SW}	Switch I/O Voltage	0	VCC	V
T _A	Operating Temperature	-40	+85	°C

Notes:

1. The input and output negative ratings maybe exceed if the input and output diode current ratings are observed.
2. The control input must be held HIGH or LOW; it must not float.



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DC ELECTRICAL CHARACTERISTICS

Unless otherwise noted. $T_A = +25^{\circ}\text{C}$. ⁽¹⁾

PARAMETER	SYM	CONDITIONS	V_{CC} (V)	MIN	TYP	MAX	UNITS
Supply Voltage	V_{CC}			1.8		5.5	V
Quiescent Supply Current	I_{CC}	INA=0V or V_{CC} , INB=0V or V_{CC} , $I_{OUT}=0$	5.5			1	μA
Switch On Resistance	R_{ON}	$0V \leq V_{SW} \leq V_{CC}$, $I_{SW}=10\text{mA}$,	4.5		5.0	8.0	Ω
			2.7		12	22	Ω
On Resistance Matching Between Channels	ΔR_{ON}	$V_{SW}=0V$, $I_{SW}=10\text{mA}$,	4.5		0.3	1.0	Ω
			2.7		1.0	3.0	Ω
Flatness for On Resistance	ΔR_{ONF}	$0V \leq V_{SW} \leq V_{CC}$, $I_{SW}=10\text{mA}$,	4.5		2.0	3.0	Ω
			2.7		12	18	Ω
Off leakage Current of Open Data Paths (NCx and NOx Pin)	I_{OFF}	$0V \leq V_{SW} \leq V_{CC}$	1.8 to 5.5	-1		1	μA
On leakage Current of Close Data Paths (NCx, NOx and COMx Pin)	I_{ON}	$0V \leq V_{SW} \leq V_{CC}$	1.8 to 5.5	-1		1	μA
Input Voltage High (INA, INB)	V_{IH}		1.8 to 5.5	1.5			V
Input Voltage Low (INA, INB)	V_{IL}		1.8 to 5.5			0.4	V



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AC ELECTRICAL CHARACTERISTICS

Unless otherwise noted. $T_A = +25^{\circ}\text{C}$. ⁽¹⁾

PARAMETER	SYM	CONDITIONS	V _{CC} (V)	MIN	TYP	MAX	UNITS
Turn-On Time	t _{ON}	R _L =300Ω, C _L =35pF, V _{SW} =0 to 1.5 V	3.0		35		ns
Turn-Off Time	t _{OFF}	R _L =300Ω, C _L =35pF, V _{SW} =0 to 1.5 V	3.0		45		ns
Break-Before-Make Time	t _{BBM}	V _{NC} = V _{NC} =1.5 V , R _L =300Ω, C _L =35pF	3.0		6		ns
Charge Injection	Q	V _G = 0V, R _G = 0Ω, C _L = 1nF	3.0		3		pC
-3db Bandwidth ⁽²⁾	BW	V _S =0dBm, R _L =50Ω, C _L =0pF	3.0		500		MHz
Off Isolation ⁽²⁾	O _{IRR}	V _S =0dBm, f=10MHz, R _L =50Ω	3.0		-55		dB
Crosstalk ⁽²⁾	X _{TALK}	V _S =0dBm, f=10MHz, R _L =50Ω	3.0		-60		dB
Output On Capacitance ⁽²⁾	C _{ON}	/OE=0V, f=1MHz	3.0		10		pF
Output Off Capacitance ⁽²⁾	C _{OFF}	/OE=3.3V, f=1MHz	3.0		6		pF

Note 1: Devices are 100% tested at $T_A = +25^{\circ}\text{C}$. Limits across the full temperature range are guaranteed by design and correlation.

Note 2: Guaranteed by characterization.

TEST CIRCUITS

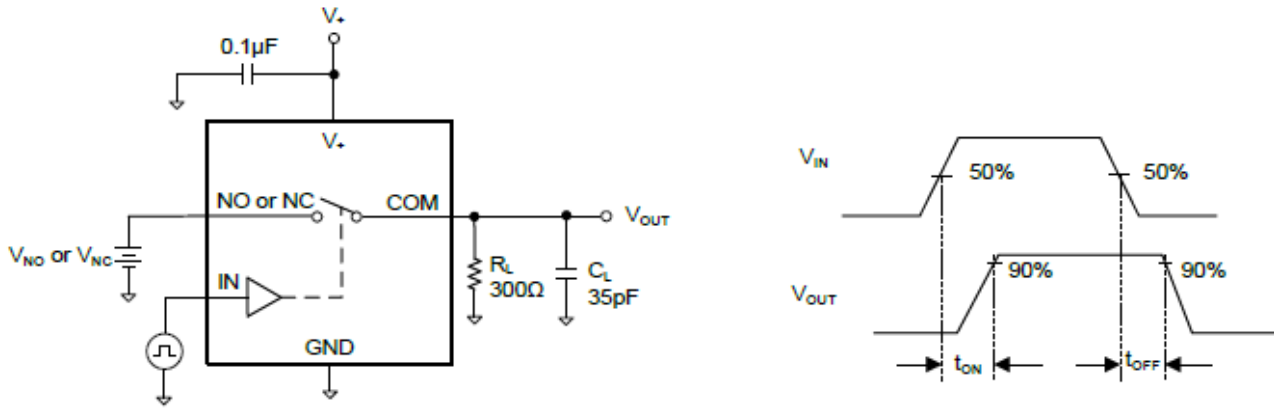


Figure 1. Switching Time

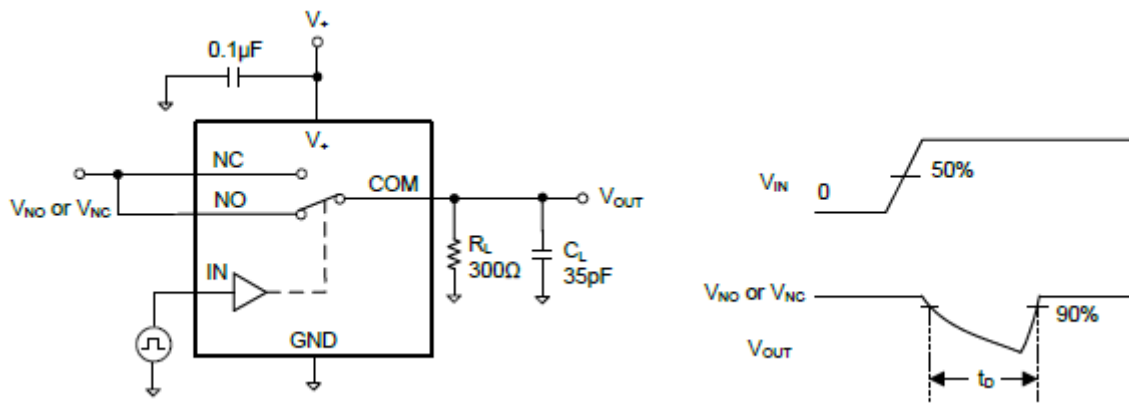


Figure 2. Break-Before-Make Interval

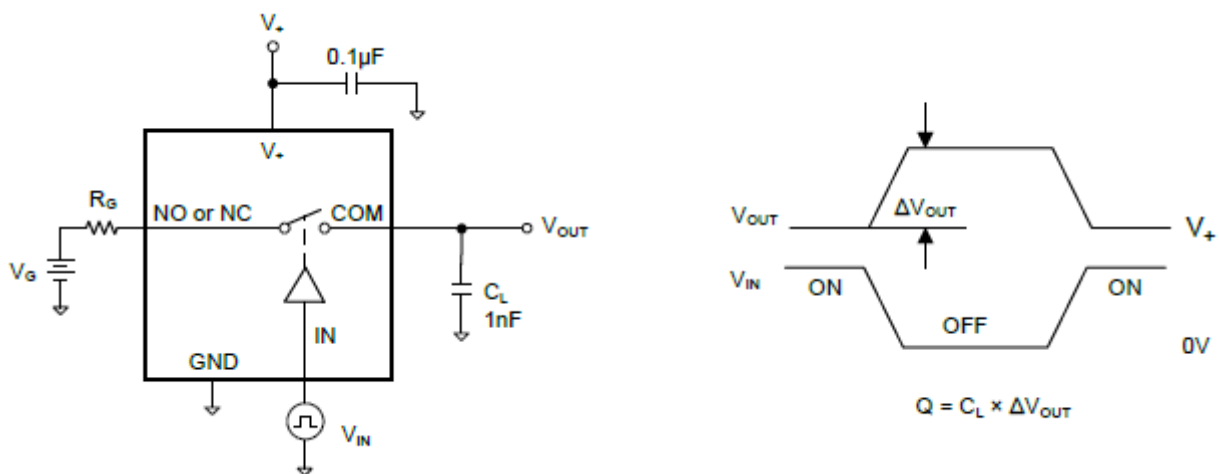


Figure 3. Charge Injection

TEST CIRCUITS (Continued)

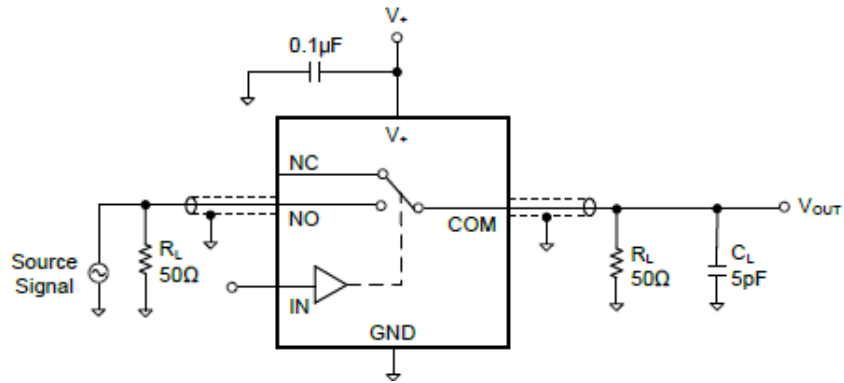


Figure 4. Off Isolation

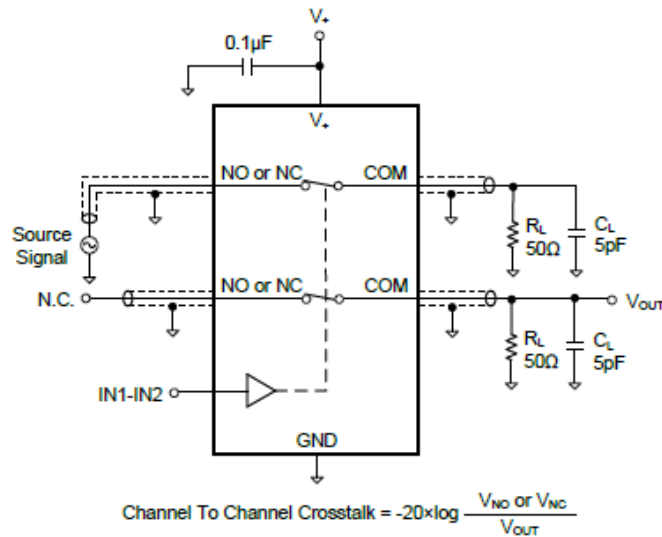


Figure 5. Channel-to-Channel Crosstalk

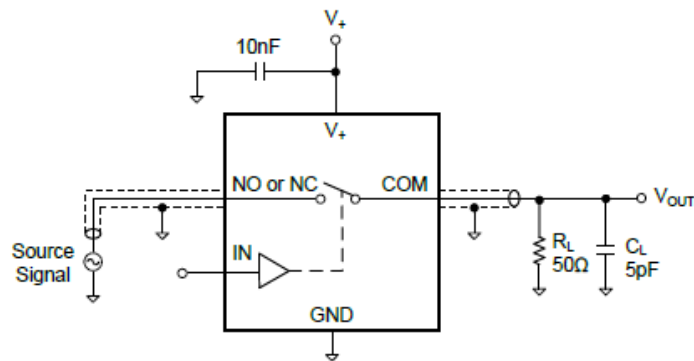
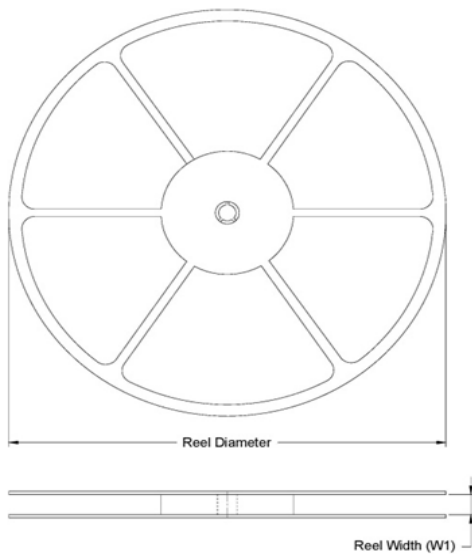


Figure 6. -3dB Bandwidth

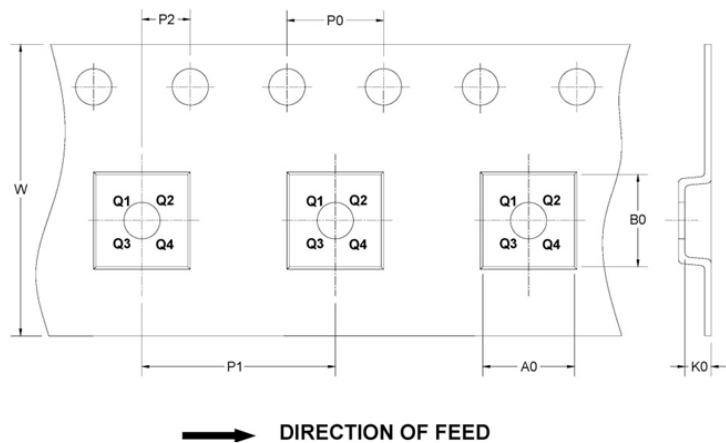
TAPE AND REEL INFORMATION

TQFN 3x3-16L

REEL DIMENSIONS



TAPE DIMENSIONS



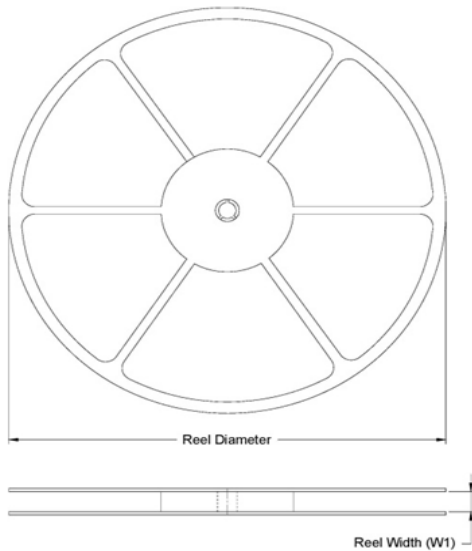
KEY PARAMETER LIST OF TAPE AND REEL

Device Name	Package Type	Reel Diameter	Unit: mm								Pin 1 Quadrant	Reel Q'ty
			Reel Width W1	A0	B0	K0	P0	P1	P2	W		
BCT4899 ETE-TR	TQFN3x3-16L	178mm	12	3.23	3.23	1.05	4	4	2	12	Q1	3000

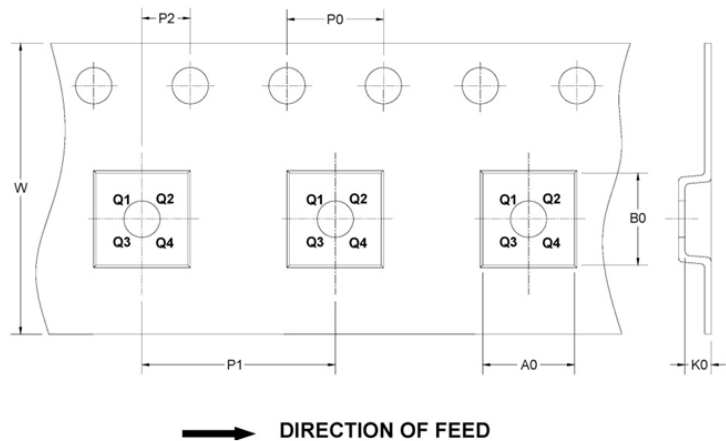
TAPE AND REEL INFORMATION

TQFN 2.5x2.5-16L

REEL DIMENSIONS



TAPE DIMENSIONS

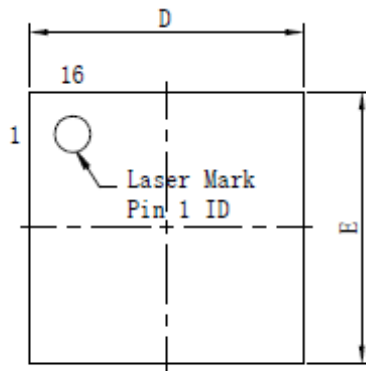


KEY PARAMETER LIST OF TAPE AND REEL

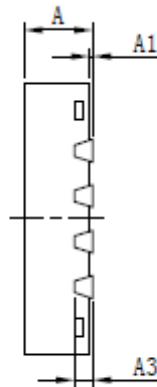
Device Name	Package Type	Reel Diameter	Unit: mm								Pin 1 Quadrant	Reel Q'ty
			Reel Width W1	A0	B0	K0	P0	P1	P2	W		
BCT4899 EFE-TR	UTQFN1.8 x2.6-16L	178mm	9.04	2.1	2.9	0.75	4	4	2	8	Q1	3000

PACKAGE OUTLINE DIMENSIONS

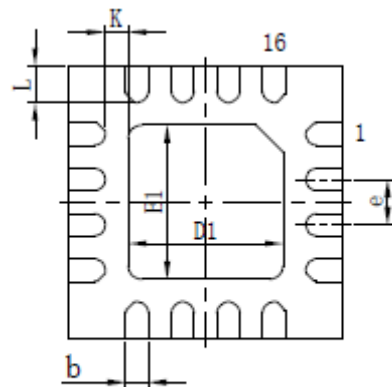
TQFN 3x3-16L



Top View



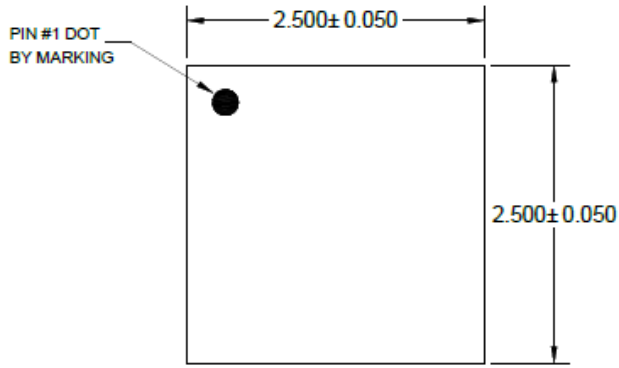
Side View



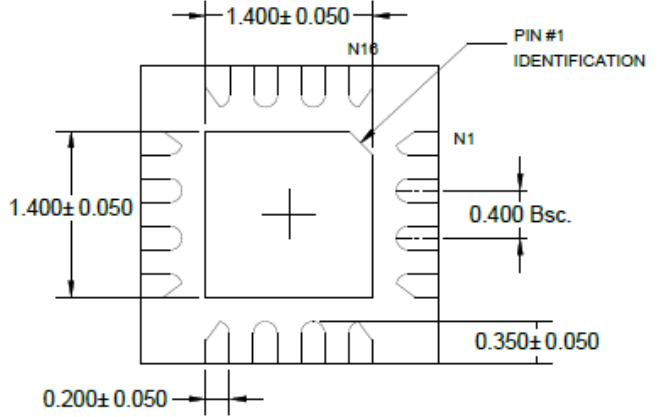
Bottom View

Symbol	Dimensions In Millimeters		
	Min	TYP	Max
A	0.70	0.75	0.80
A1	0.00		0.05
A3		0.203	
b	0.20	0.25	0.30
D	2.90	3.00	3.10
E	2.90	3.00	3.10
D1	1.60	1.70	1.80
E1	1.60	1.70	1.80
e		0.50	
K	0.20		
L	0.30	0.40	0.50

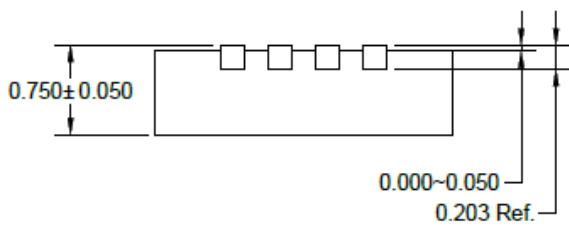
TQFN 2.5x2.5-16L



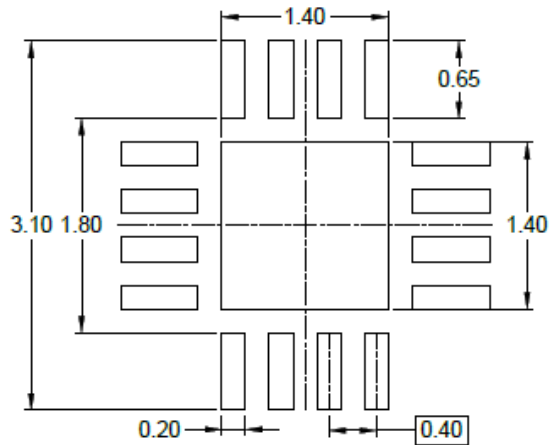
TOP VIEW



BOTTOM VIEW

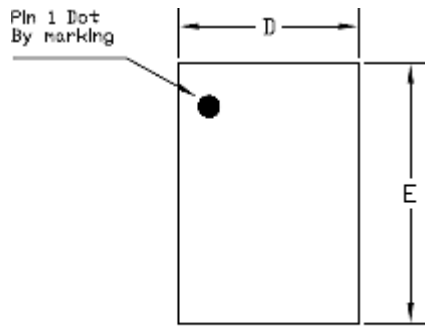


SIDE VIEW

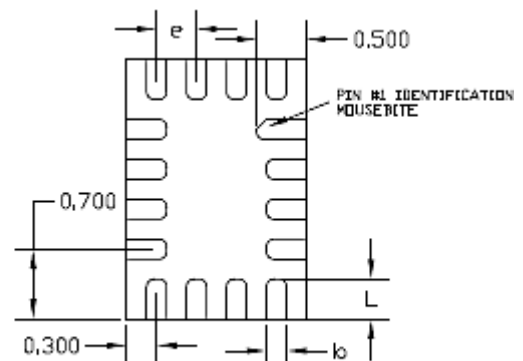


RECOMMENDED LAND PATTERN

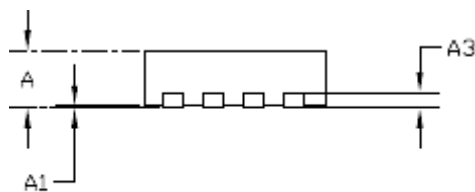
UTQFN 1.8x2.6 -16L



TOP VIEW



BOTTOM VIEW



SIDE VIEW

COMMON DIMENSIONS(MM)			
PKG.	UT:ULTRA THIN		
REF.	MIN.	NOM.	MAX
A	>0.50	0.55	0.60
A1	0.00	-	0.05
A3	0.15 REF.		
D	1.75	1.80	1.85
E	2.55	2.60	2.65
L	0.30	0.40	0.50
b	0.15	0.20	0.25
e	0.40 BSC		