Mux / Demux Bus Switch

The 7SB3257 Mux / Demux Bus Switch is an advanced high–speed line switch in ultra–small footprint.

Features

- High Speed: $t_{PD} = 0.25 \text{ ns (Max)} @ V_{CC} = 4.5 \text{ V}$
- 3 Ω Switch Connection Between 2 Ports
- Power Down Protection Provided on Inputs
- Ultra-Small Packages
- NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable
- These Devices are Pb–Free, Halogen Free/BFR Free and are RoHS Compliant

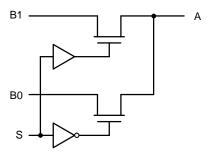
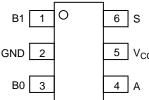


Figure 1. Logic Diagram



(Top View)



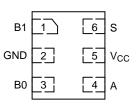


Figure 3. ULLGA6/UDFN6 (Top View)

Function Table

Input S	Function
L	A = B0
Н	A = B1



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SOT-363/SC70-6/SC-88 DF SUFFIX CASE 419B









ULLGA6 1.0 x 1.0 CASE 613AD





ULLGA6 1.2 x 1.0 CASE 613AE





ULLGA6 1.45 x 1.0 CASE 613AF





UDFN6 1.0 x 1.0 CASE 517BX





UDFN6 1.2 x 1.0 CASE 517AA





UDFN6 1.45 x 1.0 CASE 517AQ



AK, AG, K, D, L = Specific Device Code M = Date Code

= Pb–Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

Table 1. MAXIMUM RATINGS

Symbol	Parame	ter	Value	Unit
V _{CC}	DC Supply Voltage		-0.5 to +7.0	V
V _{IN}	Control Pin Input Voltage		-0.5 to +7.0	V
V _{I/O}	Switch Input / Output Voltage		-0.5 to +7.0	٧
I _{IK}	Control Pin DC Input Diode Current	V _{IN} < GND	-50	mA
I _{OK}	Switch I/O Port DC Diode Current	V _{I/O} < GND	-50	mA
Io	On–State Switch Current		±128	mA
	Continuous Current Through V _{CC} or GND		±150	mA
Icc	DC Supply Current per Supply Pin		±150	mA
I _{GND}	DC Ground Current per Ground Pin		±150	mA
T _{STG}	Storage Temperature Range		-65 to +150	°C
TL	Lead Temperature, 1 mm from Case for 10	Seconds	260	°C
TJ	Junction Temperature Under Bias		150	°C
$\theta_{\sf JA}$	Thermal Resistance	SC-88 / TSOP-6 (Note 1) ULLGA6/UDFN6	333 496	°C/W
P _D	Power Dissipation in Still Air at 85°C	SC-88 / TSOP-6 (Note 1) ULLGA6/UDFN6	200 252	mW
MSL	Moisture Sensitivity		Level 1	
F _R	Flammability Rating	Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in	
V _{ESD}	ESD Withstand Voltage	Human Body Mode (Note 2) Machine Mode (Note 3) Charged Device Mode (Note 4)	>2000 >200 N/A	V
I _{LATCHUP}	Latchup Performance Above V _{CC} and Below	w GND at 85°C (Note 5)	±100	mA

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

- 1. Measured with minimum pad spacing on an FR4 board, using 10 mm-by-1 inch, 2 ounce copper trace no air flow.
- 2. Tested to EIA/ JESD22-A114-A
- 3. Tested to EIA/ JESD22-A115-A
- 4. Tested to JESD22-C101-A
- 5. Tested to EIA / JESD78.

Table 2. RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V _{CC}	Positive DC Supply Voltage	4.0	5.5	V
VI	Control Pin Input Voltage	0	5.5	V
V _{I/O}	Switch Input / Output Voltage	0	5.5	V
T _A	Operating Free–Air Temperature	-55	+125	°C
Δt / ΔV	Input Transition Rise or Fall Rate Control Input Switch I/O	0	5 DC	nS/V

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

Table 3. DC ELECTRICAL CHARACTERISTICS

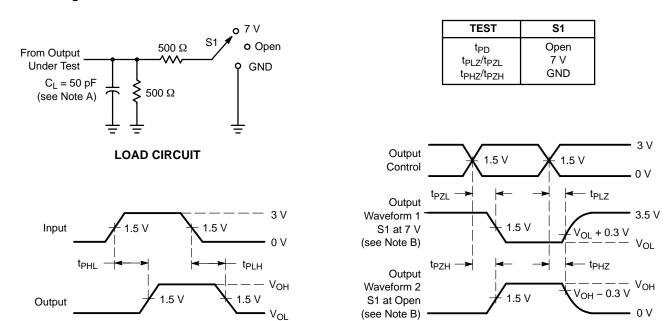
				٦	Γ _A = 25°(С	T _A = -55°C	to +125°C	
Symbol	Parameter	Conditions	V _{CC} (V)	Min	Тур	Max	Min	Max	Unit
V _{IK}	Clamp Diode Voltage	I _{IN} = -18 mA	4.5			-1.2		-1.2	V
V _{IH}	High-Level Input Voltage (Control)		4.0 to 5.5	2.0			2.0		V
V_{IL}	Low-Level Input Voltage (Control)		4.0 to 5.5			0.8		0.8	V
I _{IN}	Input Leakage Current	$0 \le V_{IN} \le 5.5 \text{ V}$	5.5			±0.1		±1.0	μΑ
I _{OFF}	Power Off Leakage Current	$V_{I/O} = 0 \text{ to } 5.5 \text{ V}$	0			±0.1		±1.0	μΑ
Icc	Quiescent Supply Current	I _O = 0, V _{IN} = V _{CC} or 0 V	5.5			±0.1		±1.0	μΑ
Δl _{CC}	Increase in Supply Current (Control Pin)	One input at 3.4 V; Other inputs at V _{CC} or GND	5.5					2.5	mA
R _{ON}	Switch ON Resistance	$V_{I/O} = 0,$ $I_{I/O} = 64 \text{ mA}$ $I_{I/O} = 30 \text{ mA}$	4.5		3	7 7		7 7	Ω
		$V_{I/O} = 2.4,$ $I_{I/O} = 15 \text{ mA}$	4.5		6	15		15	
		$V_{I/O} = 2.4,$ $I_{I/O} = 15 \text{ mA}$	4.0		10	20		20	

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Table 4. AC ELECTRICAL CHARACTERISTICS

				1	T _A = 25°0	C		-55°C 25°C	
Symbol	Parameter	V _{CC} (V)	Test Condition	Min	Тур	Max	Min	Max	Unit
t _{PD}	Propagation Delay, A to B or B to A	4.0 to 5.5	See Figure 4			0.25		0.25	ns
	AIOBOIBIOA								
t _{EN}	Output Enable Time	4.5 to 5.5		8.0	2.5	4.2	0.8	4.2	ns
		4.0		8.0	3.0	4.6	0.8	4.6	
t _{DIS}	Output Disable Time	4.5 to 5.5		8.0	3.1	4.8	0.8	4.8	ns
		4.0		0.8	2.9	4.4	0.8	4.4	
C _{IN}	Control Input Capacitance	5.0	V _{IN} = 3 V or 0		2.0				pF
C _{IO(ON)}	Switch On Capacitance	5.0	Switch ON		10				pF
C _{IO(OFF)}	Switch Off Capacitance	5.0	Switch OFF		3.5				pF

AC Loading and Waveforms



A. C_L includes probe and jig capacitance.

VOLTAGE WAVEFORMS

PROPAGATION DELAY TIMES

- B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
- C. All input pulses are supplied by generators having the following characteristics: PRR \leq 10 MHz, $Z_O = 50~\Omega$, $t_f \leq 2.5~\text{ns}$, $t_f \leq 2.5~\text{ns}$.

VOLTAGE WAVEFORMS

ENABLE AND DISABLE TIMES

- D. The output is measured with one input transition per measurement.
- E. t_{PLZ} and t_{PHZ} are the same as t_{dis}.
- F. t_{PZL} and t_{PZH} are the same as t_{en} .
- G. t_{PLH} and t_{PHL} are the same as t_{pd}.

Figure 4. Load Circuit and Voltage Waveforms

DEVICE ORDERING INFORMATION

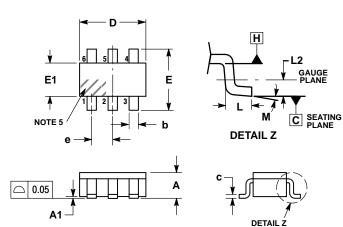
Device	Package	Shipping [†]
7SB3257DTT1G		
NLV7SB3257DTT1G*	TSOP-6 (Pb-Free)	3000 / Tape & Reel
7SB3257DTT2G	(2,	
7SB3257DFT2G	SC-88 (Pb-Free)	3000 / Tape & Reel
7SB3257AMX1TCG	ULLGA6 - 1.45 x 1.0, 0.5P (Pb-Free)	3000 / Tape & Reel
7SB3257BMX1TCG	ULLGA6 - 1.2 x 1.0, 0.4P (Pb-Free)	3000 / Tape & Reel
7SB3257CMX1TCG	ULLGA6 – 1.0 x 1.0, 0.35P (Pb-Free)	3000 / Tape & Reel
7SB3257MU1TCG	UDFN6 - 1.45 x 1.0, 0.5P (Pb-Free)	3000 / Tape & Reel
7SB3257MUTCG	UDFN6 - 1.2 x 1.0, 0.4P (Pb-Free)	3000 / Tape & Reel
7SB3257MU3TCG	UDFN6 - 1.0 x 1.0, 0.35P (Pb-Free)	3000 / Tape & Reel

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

^{*}NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable.

PACKAGE DIMENSIONS

TSOP-6 CASE 318G-02 ISSUE U



NOTES:

- NOTES:

 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.

 2. CONTROLLING DIMENSION: MILLIMETERS.

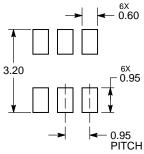
 3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

 4. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.15 PER SIDE. DIMENSIONS D AND E1 ARE DETERMINED AT DATUM H.

 5. PIN ONE INDICATOR MUST BE LOCATED IN THE INDICATED ZONE.

	MILLIMETERS			
DIM	MIN	NOM	MAX	
Α	0.90	1.00	1.10	
A1	0.01	0.06	0.10	
b	0.25	0.38	0.50	
С	0.10	0.18	0.26	
D	2.90	3.00	3.10	
Е	2.50	2.75	3.00	
E1	1.30	1.50	1.70	
е	0.85	0.95	1.05	
L	0.20	0.40	0.60	
L2	0.25 BSC			
М	0°	-	10°	

RECOMMENDED SOLDERING FOOTPRINT*



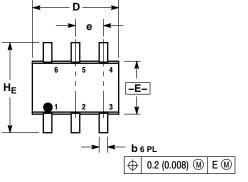
DIMENSIONS: MILLIMETERS

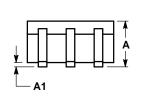
^{*}For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

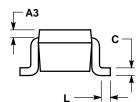
PACKAGE DIMENSIONS

SC-88/SC70-6/SOT-363 CASE 419B-02

ISSUE W



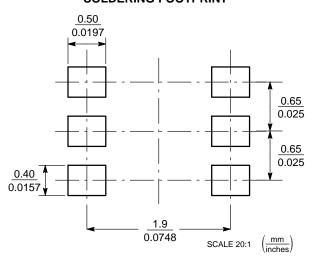




- NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. 419B-01 OBSOLETE, NEW STANDARD 419B-02.

	MILLIMETERS				INCHES	3
DIM	MIN	NOM	MAX	MIN	NOM	MAX
Α	0.80	0.95	1.10	0.031	0.037	0.043
A1	0.00	0.05	0.10	0.000	0.002	0.004
A3		0.20 RE	F		0.008 RI	EF
b	0.10	0.21	0.30	0.004	0.008	0.012
C	0.10	0.14	0.25	0.004	0.005	0.010
D	1.80	2.00	2.20	0.070	0.078	0.086
Е	1.15	1.25	1.35	0.045	0.049	0.053
е		0.65 BS	C	0	.026 BS	С
Г	0.10	0.20	0.30	0.004	0.008	0.012
ΗE	2.00	2.10	2.20	0.078	0.082	0.086

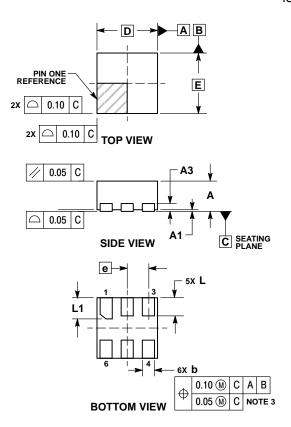
SOLDERING FOOTPRINT*



*For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PACKAGE DIMENSIONS

UDFN6 1.0x1.0, 0.35P CASE 517BX **ISSUE O**



NOTES:

- NOTES:

 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.

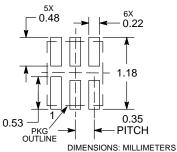
 2. CONTROLLING DIMENSION: MILLIMETERS.

 3. DIMENSION & APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.20 MM FROM TERMINAL TIP.

 4. PACKAGE DIMENSIONS EXCLUSIVE OF BURDES AND MOLD EL ASH.
- BURRS AND MOLD FLASH.

-	-	-	
	MILLIMETERS		
DIM	MIN	MAX	
Α	0.45	0.55	
A1	0.00	0.05	
A3	0.13	REF	
b	0.12	0.22	
D	1.00	BSC	
Е	1.00	BSC	
е	0.35 BSC		
L	0.25	0.35	
L1	0.30	0.40	

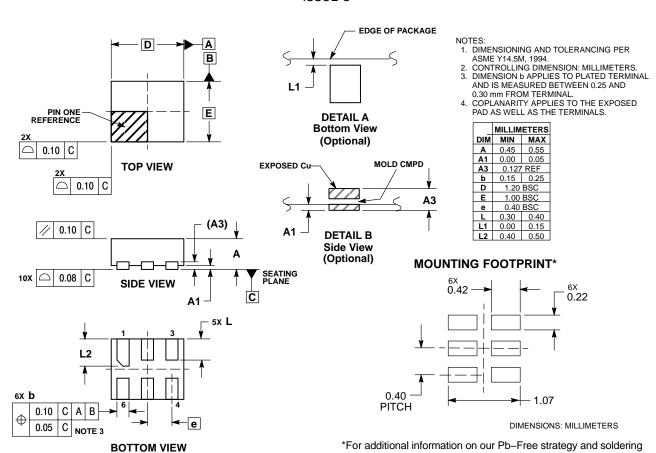
RECOMMENDED SOLDERING FOOTPRINT*



*For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

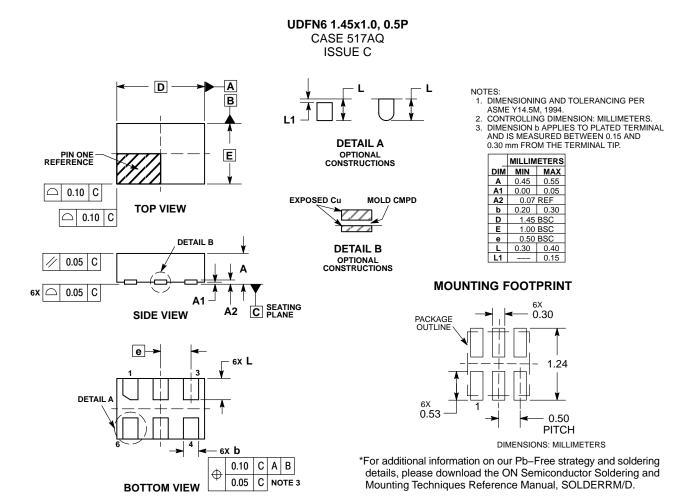
PACKAGE DIMENSIONS

UDFN6 1.2x1.0, 0.4PCASE 517AA ISSUE C



details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

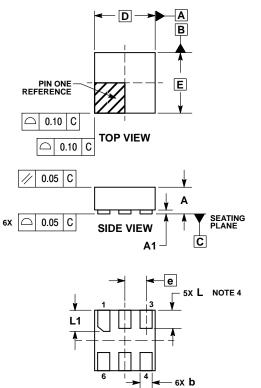
PACKAGE DIMENSIONS



PACKAGE DIMENSIONS

ULLGA6 1.0x1.0, 0.35P

CASE 613AD **ISSUE A**



BOTTOM VIEW

0.10 | C | A | B

0.05 C NOTE 3

Ф

NOTES:

- NOTES:

 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.

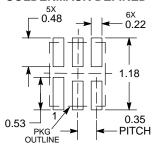
 2. CONTROLLING DIMENSION: MILLIMETERS.

 3. DIMENSION & APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 mm FROM THE TERMINAL TIP.

 4. A MAXIMUM OF 0.05 PULL BACK OF THE PLATED TERMINAL FROM THE EDGE OF THE PACKAGE IS ALLOWED.

	MILLIMETERS			
DIM	MIN	MAX		
Α		0.40		
A1	0.00	0.05		
b	0.12	0.22		
D	1.00	BSC		
Е	1.00	BSC		
е	0.35 BSC			
L	0.25	0.35		
L1	0.30	0.40		

MOUNTING FOOTPRINT SOLDERMASK DEFINED*

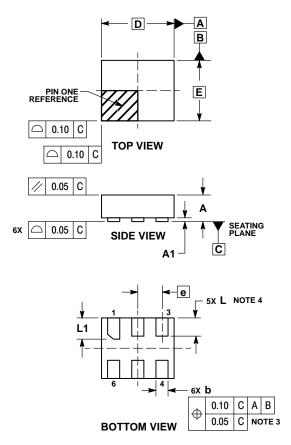


DIMENSIONS: MILLIMETERS

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PACKAGE DIMENSIONS

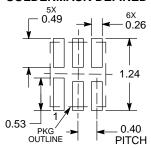
ULLGA6 1.2x1.0, 0.4P CASE 613AE **ISSUE A**



- NOTES:
 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: MILLIMETERS.
 3. DIMENSION & APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 mm FROM THE TERMINAL TIP.
 4. A MAXIMUM OF 0.05 PULL BACK OF THE PLATED TERMINAL FROM THE EDGE OF THE PEACKAGE IS ALLOWED. PACKAGE IS ALLOWED.

	MILLIMETERS		
DIM	MIN	MAX	
Α		0.40	
A1	0.00	0.05	
b	0.15	0.25	
D	1.20	BSC	
E	1.00	BSC	
е	0.40 BSC		
L	0.25	0.35	
L1	0.35	0.45	

MOUNTING FOOTPRINT SOLDERMASK DEFINED*

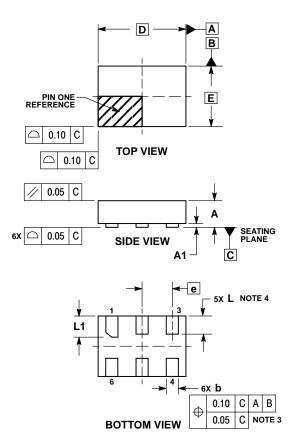


DIMENSIONS: MILLIMETERS

^{*}For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PACKAGE DIMENSIONS

ULLGA6 1.45x1.0, 0.5P CASE 613AF **ISSUE A**

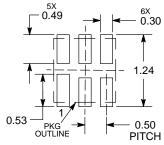


NOTES

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994. CONTROLLING DIMENSION: MILLIMETERS.
- DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 mm FROM THE TERMINAL TIP. A MAXIMUM OF 0.05 PULL BACK OF THE
- PLATED TERMINAL FROM THE EDGE OF THE PACKAGE IS ALLOWED.

	MILLIMETERS			
DIM	MIN	MAX		
Α		0.40		
A1	0.00	0.05		
b	0.15	0.25		
D	1.45	BSC		
Е	1.00	BSC		
е	0.50 BSC			
L	0.25	0.35		
L1	0.30	0.40		

MOUNTING FOOTPRINT SOLDERMASK DEFINED*



DIMENSIONS: MILLIMETERS

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