

74LVC1G384

Bilateral switch

Rev. 7 — 7 December 2016

Product data sheet

1. General description

The 74LVC1G384 provides one single pole, single throw analog switch function. It has two input/output terminals (Y and Z) and an active LOW enable input pin (\bar{E}). When pin \bar{E} is HIGH, the analog switch is turned off.

Schmitt trigger action at the enable input makes the circuit tolerant of slower input rise and fall times across the entire V_{CC} range from 1.65 V to 5.5 V.

2. Features and benefits

- Wide supply voltage range from 1.65 V to 5.5 V
- Very low ON resistance:
 - ◆ 7.5 Ω (typical) at $V_{CC} = 2.7$ V
 - ◆ 6.5 Ω (typical) at $V_{CC} = 3.3$ V
 - ◆ 6 Ω (typical) at $V_{CC} = 5$ V
- ESD protection:
 - ◆ HBM JESD22-A114F exceeds 2000 V
 - ◆ MM JESD22-A115-A exceeds 200 V
- Switch current capability of 32 mA
- High noise immunity
- CMOS low power consumption
- TTL interface compatibility at 3.3 V
- Latch-up performance meets requirements of JESD 78 Class I
- Enable input accepts voltages up to 5.5 V
- Inputs accept voltages up to 5 V
- Multiple package options
- Specified from -40 °C to $+85$ °C and from -40 °C to $+125$ °C

3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74LVC1G384GW	-40 °C to $+125$ °C	TSSOP5	plastic thin shrink small outline package; 5 leads; body width 1.25 mm	SOT353-1
74LVC1G384GV	-40 °C to $+125$ °C	SC-74A	plastic surface-mounted package; 5 leads	SOT753
74LVC1G384GM	-40 °C to $+125$ °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body $1 \times 1.45 \times 0.5$ mm	SOT886

Table 1. Ordering information ...continued

Type number	Package			Version
	Temperature range	Name	Description	
74LVC1G384GF	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1 × 0.5 mm	SOT891
74LVC1G384GN	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm	SOT1115
74LVC1G384GS	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm	SOT1202
74LVC1G384GX	-40 °C to +125 °C	X2SON5	X2SON5: plastic thermal enhanced extremely thin small outline package; no leads; 5 terminals; body 0.8 × 0.8 × 0.35 mm	SOT1226

4. Marking

Table 2. Marking

Type number	Marking code ^[1]
74LVC1G384GW	YL
74LVC1G384GV	YL
74LVC1G384GM	YL
74LVC1G384GF	YL
74LVC1G384GN	YL
74LVC1G384GS	YL
74LVC1G384GX	YL

[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

5. Functional diagram

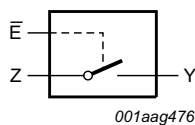


Fig 1. Logic symbol

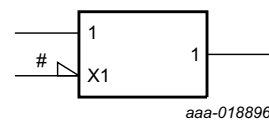


Fig 2. IEC logic symbol

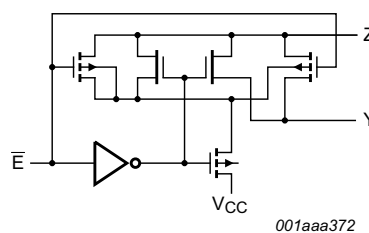


Fig 3. Logic diagram

6. Pinning information

6.1 Pinning

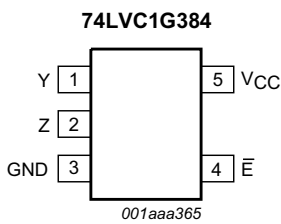


Fig 4. Pin configuration SOT353-1 (TSSOP5) and SOT753 (SC-74A)

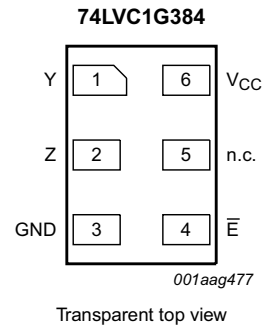


Fig 5. Pin configuration SOT886 (XSON6)

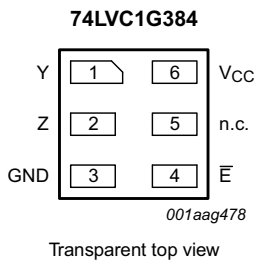


Fig 6. Pin configuration SOT891 (XSON6), SOT1115 (XSON6) and SOT1202 (XSON6)

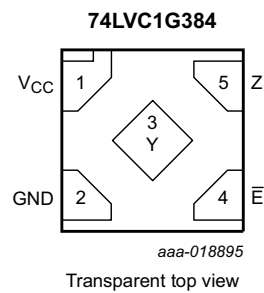


Fig 7. Pin configuration SOT1226 (X2SON5)

6.2 Pin description

Table 3. Pin description

Symbol	Pin			Description
	TSSOP5 and SC-74	XSON6	X2SON5	
Y	1	1	3	independent input or output
Z	2	2	5	independent output or input
GND	3	3	2	ground (0 V)
\bar{E}	4	4	4	enable input (active LOW)
n.c.	-	5	-	not connected
V _{CC}	5	6	1	supply voltage

7. Functional description

Table 4. Function table^[1]

Input \bar{E}	Switch
L	ON-state
H	OFF-state

[1] H = HIGH voltage level; L = LOW voltage level.

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CC}	supply voltage		-0.5	+6.5	V
V_I	input voltage		-0.5	+6.5	V
I_{IK}	input clamping current	$V_I < -0.5 \text{ V}$ or $V_I > V_{CC} + 0.5 \text{ V}$	-50	-	mA
I_{SK}	switch clamping current	$V_I < -0.5 \text{ V}$ or $V_I > V_{CC} + 0.5 \text{ V}$	-	± 50	mA
V_{SW}	switch voltage	enable and disable mode	-0.5	$V_{CC} + 0.5$	V
I_{SW}	switch current	$V_{SW} > -0.5 \text{ V}$ or $V_{SW} < V_{CC} + 0.5 \text{ V}$	-	± 50	mA
I_{CC}	supply current		-	100	mA
I_{GND}	ground current		-100	-	mA
T_{stg}	storage temperature		-65	+150	°C
P_{tot}	total power dissipation	$T_{amb} = -40 \text{ °C}$ to $+125 \text{ °C}$	-	250	mW

[1] The minimum input voltage rating may be exceeded if the input current rating is observed.

[2] The minimum and maximum switch voltage ratings may be exceeded if the switch clamping current rating is observed.

[3] For TSSOP5 and SC-74A packages: above 87.5 °C the value of P_{tot} derates linearly with 4.0 mW/K.
For XSON6 and X2SON5 packages: above 118 °C the value of P_{tot} derates linearly with 7.8 mW/K.

9. Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CC}	supply voltage		1.65	-	5.5	V
V_I	input voltage		0	-	5.5	V
V_{SW}	switch voltage		0	-	V_{CC}	V
T_{amb}	ambient temperature		-40	-	+125	°C
$\Delta t/\Delta V$	input transition rise and fall rate	$V_{CC} = 1.65 \text{ V}$ to 2.7 V	-	-	20	ns/V
		$V_{CC} = 2.7 \text{ V}$ to 5.5 V	-	-	10	ns/V

[1] To avoid sinking GND current from terminal Z when switch current flows in terminal Y, the voltage drop across the bidirectional switch must not exceed 0.4 V. If the switch current flows into terminal Z, no GND current will flow from terminal Y. In this case, there is no limit for the voltage drop across the switch.

10. Static characteristics

Table 7. Static characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ ^[1]	Max	Min	Max	
V _{IH}	HIGH-level input voltage	V _{CC} = 1.65 V to 1.95 V	0.65V _{CC}	-	-	0.65 V _{CC}	-	V
		V _{CC} = 2.3 V to 2.7 V	1.7	-	-	1.7	-	V
		V _{CC} = 2.7 V to 3.6 V	2.0	-	-	2.0	-	V
		V _{CC} = 4.5 V to 5.5 V	0.7V _{CC}	-	-	0.7V _{CC}	-	V
V _{IL}	LOW-level input voltage	V _{CC} = 1.65 V to 1.95 V	-	-	0.35V _{CC}	-	0.35V _{CC}	V
		V _{CC} = 2.3 V to 2.7 V	-	-	0.7	-	0.7	V
		V _{CC} = 2.7 V to 3.6 V	-	-	0.8	-	0.8	V
		V _{CC} = 4.5 V to 5.5 V	-	-	0.3V _{CC}	-	0.3V _{CC}	V
I _I	input leakage current	pin \bar{E} ; V _I = 5.5 V or GND; V _{CC} = 0 V to 5.5 V ^[2]	-	±0.1	±1	-	±1	μA
I _{S(OFF)}	OFF-state leakage current	V _{CC} = 5.5 V; see Figure 8 ^[2]	-	±0.1	±0.2	-	±0.5	μA
I _{S(ON)}	ON-state leakage current	V _{CC} = 5.5 V; see Figure 9 ^[2]	-	±0.1	±1	-	±2	μA
I _{CC}	supply current	V _I = 5.5 V or GND; V _{SW} = GND or V _{CC} ; V _{CC} = 1.65 V to 5.5 V ^[2]	-	0.1	4	-	4	μA
ΔI _{CC}	additional supply current	pin \bar{E} ; V _I = V _{CC} - 0.6 V; V _{SW} = GND or V _{CC} ; V _{CC} = 5.5 V ^[2]	-	5	500	-	500	μA
C _I	input capacitance		-	2.0	-	-	-	pF
C _{S(OFF)}	OFF-state capacitance		-	5.0	-	-	-	pF
C _{S(ON)}	ON-state capacitance		-	9.5	-	-	-	pF

[1] All typical values are measured at T_{amb} = 25 °C.

[2] These typical values are measured at V_{CC} = 3.3 V.

10.1 Test circuits

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$V_I = V_{CC}$ or GND and $V_O =$ GND or V_{CC} .

Fig 8. Test circuit for measuring OFF-state leakage current

001aag480

$V_I = V_{CC}$ or GND and $V_O =$ open circuit.

Fig 9. Test circuit for measuring ON-state leakage current

10.2 ON resistance

Table 8. ON resistance

At recommended operating conditions; voltages are referenced to GND (ground 0 V); for graphs see [Figure 11](#) to [Figure 16](#).

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ ^[1]	Max	Min	Max	
R _{ON(peak)}	ON resistance (peak)	$V_I =$ GND to V_{CC} ; see Figure 10						
		$I_{SW} = 4$ mA; $V_{CC} = 1.65$ V to 1.95 V	-	34.0	130	-	195	Ω
		$I_{SW} = 8$ mA; $V_{CC} = 2.3$ V to 2.7 V	-	12.0	30	-	45	Ω
		$I_{SW} = 12$ mA; $V_{CC} = 2.7$ V	-	10.4	25	-	38	Ω
		$I_{SW} = 24$ mA; $V_{CC} = 3$ V to 3.6 V	-	7.8	20	-	30	Ω
		$I_{SW} = 32$ mA; $V_{CC} = 4.5$ V to 5.5 V	-	6.2	15	-	23	Ω
R _{ON(rail)}	ON resistance (rail)	$V_I =$ GND; see Figure 10						
		$I_{SW} = 4$ mA; $V_{CC} = 1.65$ V to 1.95 V	-	8.2	18	-	27	Ω
		$I_{SW} = 8$ mA; $V_{CC} = 2.3$ V to 2.7 V	-	7.1	16	-	24	Ω
		$I_{SW} = 12$ mA; $V_{CC} = 2.7$ V	-	6.9	14	-	21	Ω
		$I_{SW} = 24$ mA; $V_{CC} = 3$ V to 3.6 V	-	6.5	12	-	18	Ω
		$I_{SW} = 32$ mA; $V_{CC} = 4.5$ V to 5.5 V	-	5.8	10	-	15	Ω
		$V_I = V_{CC}$; see Figure 10				-		
		$I_{SW} = 4$ mA; $V_{CC} = 1.65$ V to 1.95 V	-	10.4	30	-	45	Ω
		$I_{SW} = 8$ mA; $V_{CC} = 2.3$ V to 2.7 V	-	7.6	20	-	30	Ω
		$I_{SW} = 12$ mA; $V_{CC} = 2.7$ V	-	7.0	18	-	27	Ω
		$I_{SW} = 24$ mA; $V_{CC} = 3$ V to 3.6 V	-	6.1	15	-	23	Ω
		$I_{SW} = 32$ mA; $V_{CC} = 4.5$ V to 5.5 V	-	4.9	10	-	15	Ω

Table 8. ON resistance ...continued

At recommended operating conditions; voltages are referenced to GND (ground 0 V); for graphs see [Figure 11](#) to [Figure 16](#).

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ ^[1]	Max	Min	Max	
R _{ON(flat)}	ON resistance (flatness)	V _I = GND to V _{CC} ^[2]						
		I _{SW} = 4 mA; V _{CC} = 1.65 V to 1.95 V	-	26.0	-	-	-	Ω
		I _{SW} = 8 mA; V _{CC} = 2.3 V to 2.7 V	-	5.0	-	-	-	Ω
		I _{SW} = 12 mA; V _{CC} = 2.7 V	-	3.5	-	-	-	Ω
		I _{SW} = 24 mA; V _{CC} = 3 V to 3.6 V	-	2.0	-	-	-	Ω
		I _{SW} = 32 mA; V _{CC} = 4.5 V to 5.5 V	-	1.5	-	-	-	Ω

[1] Typical values are measured at T_{amb} = 25 °C and nominal V_{CC}.

[2] Flatness is defined as the difference between the maximum and minimum value of ON resistance measured at identical V_{CC} and temperature.

10.3 ON resistance test circuit and graphs

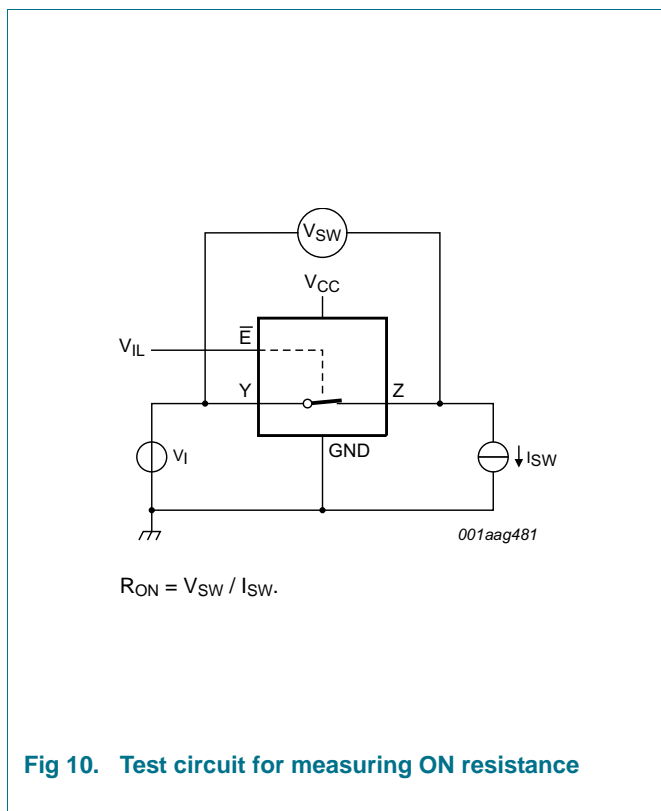
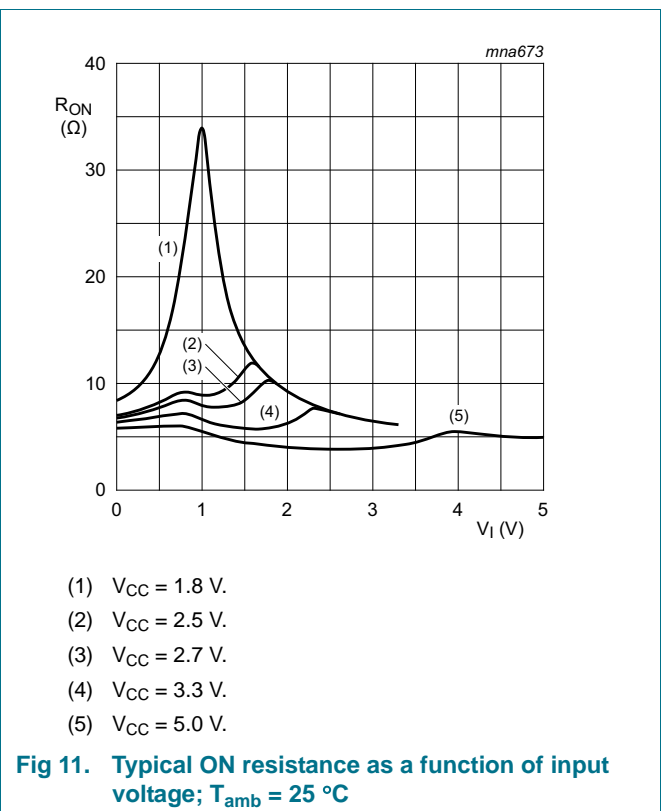
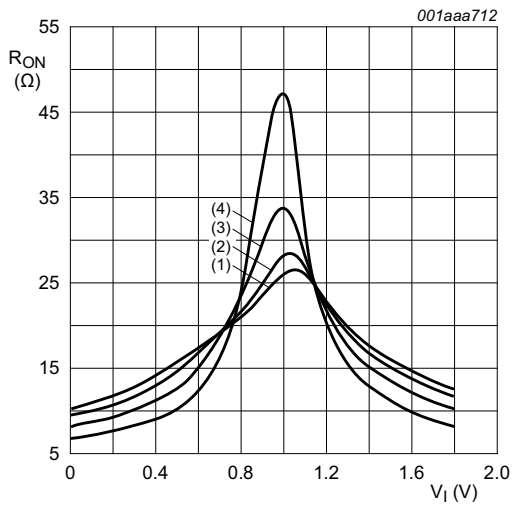


Fig 10. Test circuit for measuring ON resistance



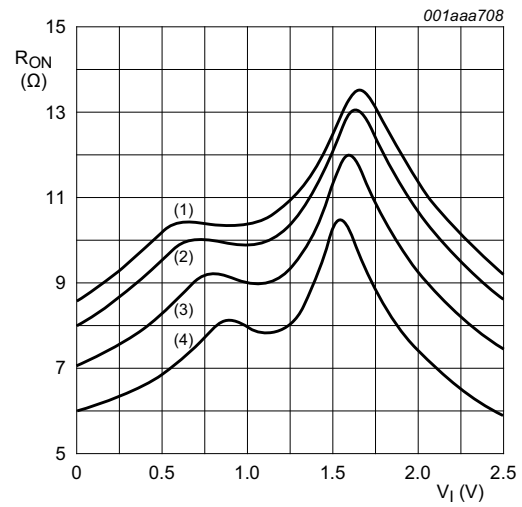
- (1) V_{CC} = 1.8 V.
- (2) V_{CC} = 2.5 V.
- (3) V_{CC} = 2.7 V.
- (4) V_{CC} = 3.3 V.
- (5) V_{CC} = 5.0 V.

Fig 11. Typical ON resistance as a function of input voltage; T_{amb} = 25 °C



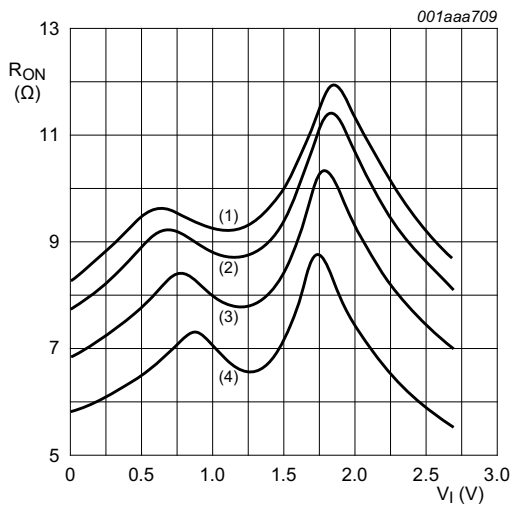
- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4) $T_{amb} = -40\text{ }^{\circ}\text{C}.$

Fig 12. ON resistance as a function of input voltage;
 $V_{CC} = 1.8\text{ V}$



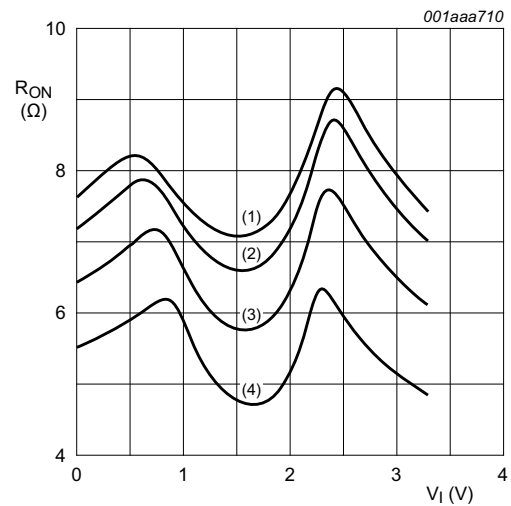
- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4) $T_{amb} = -40\text{ }^{\circ}\text{C}.$

Fig 13. ON resistance as a function of input voltage;
 $V_{CC} = 2.5\text{ V}$



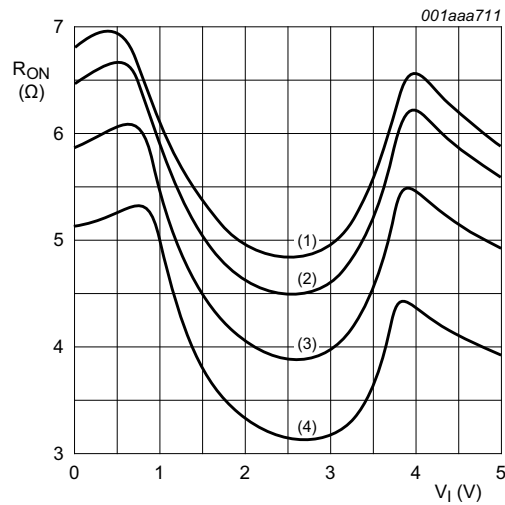
- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4) $T_{amb} = -40\text{ }^{\circ}\text{C}.$

Fig 14. ON resistance as a function of input voltage;
 $V_{CC} = 2.7\text{ V}$



- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4) $T_{amb} = -40\text{ }^{\circ}\text{C}.$

Fig 15. ON resistance as a function of input voltage;
 $V_{CC} = 3.3\text{ V}$



- (1) $T_{amb} = 125\text{ °C}$.
- (2) $T_{amb} = 85\text{ °C}$.
- (3) $T_{amb} = 25\text{ °C}$.
- (4) $T_{amb} = -40\text{ °C}$.

Fig 16. ON resistance as a function of input voltage; $V_{CC} = 5.0\text{ V}$

11. Dynamic characteristics

Table 9. Dynamic characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 19](#).

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ ^[1]	Max	Min	Max	
t_{pd}	propagation delay	Y to Z or Z to Y; see Figure 17 ^{[2][3]}						
		$V_{CC} = 1.65\text{ V to }1.95\text{ V}$	-	0.8	2.0	-	3.0	ns
		$V_{CC} = 2.3\text{ V to }2.7\text{ V}$	-	0.4	1.2	-	2.0	ns
		$V_{CC} = 2.7\text{ V}$	-	0.4	1.0	-	1.5	ns
		$V_{CC} = 3.0\text{ V to }3.6\text{ V}$	-	0.3	0.8	-	1.5	ns
		$V_{CC} = 4.5\text{ V to }5.5\text{ V}$	-	0.2	0.6	-	1.0	ns
t_{en}	enable time	\bar{E} to Y or Z; see Figure 18 ^[4]						
		$V_{CC} = 1.65\text{ V to }1.95\text{ V}$	1.0	10.0	12.0	1.0	15.5	ns
		$V_{CC} = 2.3\text{ V to }2.7\text{ V}$	1.0	5.7	6.5	1.0	8.5	ns
		$V_{CC} = 2.7\text{ V}$	1.0	5.4	6.0	1.0	8.0	ns
		$V_{CC} = 3.0\text{ V to }3.6\text{ V}$	1.0	4.8	5.0	1.0	6.5	ns
		$V_{CC} = 4.5\text{ V to }5.5\text{ V}$	1.0	3.3	4.2	1.0	5.5	ns

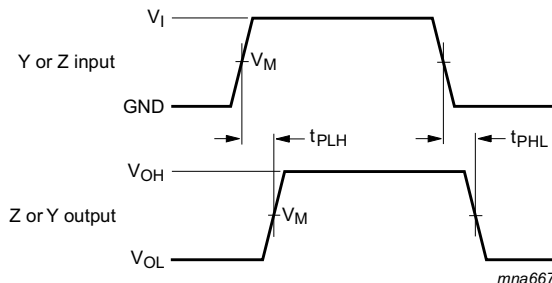
Table 9. Dynamic characteristics ...continued

At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 19](#).

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ ^[1]	Max	Min	Max	
t _{dis}	disable time	\bar{E} to Y or Z; see Figure 18 ^[5]						
		V _{CC} = 1.65 V to 1.95 V	1.0	7.4	10.0	1.0	13.0	ns
		V _{CC} = 2.3 V to 2.7 V	1.0	4.1	6.9	1.0	9.0	ns
		V _{CC} = 2.7 V	1.0	4.9	7.5	1.0	9.5	ns
		V _{CC} = 3.0 V to 3.6 V	1.0	5.4	6.5	1.0	8.5	ns
		V _{CC} = 4.5 V to 5.5 V	1.0	3.6	5.0	1.0	6.5	ns
C _{PD}	power dissipation capacitance	C _L = 50 pF; f _i = 10 MHz; V _I = GND to V _{CC} ^[6]						
		V _{CC} = 2.5 V	-	13.7	-	-	-	pF
		V _{CC} = 3.3 V	-	15.2	-	-	-	pF
		V _{CC} = 5.0 V	-	18.3	-	-	-	pF

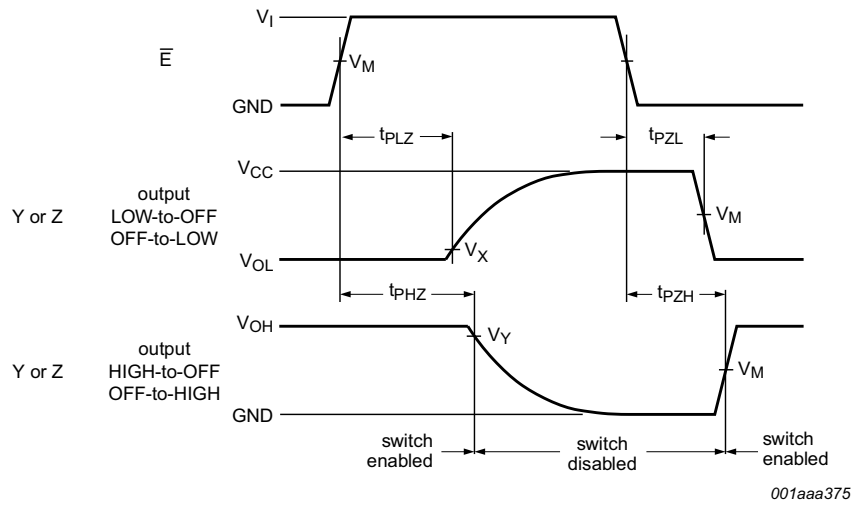
- [1] Typical values are measured at T_{amb} = 25 °C and nominal V_{CC}.
- [2] t_{pd} is the same as t_{PLH} and t_{PHL}.
- [3] propagation delay is the calculated RC time constant of the typical ON resistance of the switch and the specified capacitance when driven by an ideal voltage source (zero output impedance).
- [4] t_{en} is the same as t_{PZH} and t_{PZL}.
- [5] t_{dis} is the same as t_{PLZ} and t_{PHZ}.
- [6] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma\{(C_L + C_{S(ON)}) \times V_{CC}^2 \times f_o\}$ where:
 f_i = input frequency in MHz;
 f_o = output frequency in MHz;
 C_L = output load capacitance in pF;
 C_{S(ON)} = maximum ON-state switch capacitance in pF;
 V_{CC} = supply voltage in V;
 N = number of inputs switching;
 Σ{(C_L + C_{S(ON)}) × V_{CC}² × f_o} = sum of the outputs.

11.1 Waveforms and test circuit



Measurement points are given in [Table 10](#).
 Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Fig 17. Input (Y or Z) to output (Z or Y) propagation delays



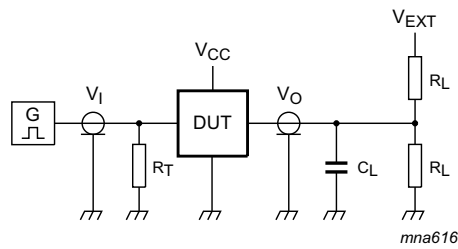
Measurement points are given in [Table 10](#).

Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Fig 18. Enable and disable times

Table 10. Measurement points

Supply voltage	Input	Output		
V_{CC}	V_M	V_M	V_X	V_Y
1.65 V to 1.95 V	$0.5V_{CC}$	$0.5V_{CC}$	$V_{OL} + 0.15 V$	$V_{OH} - 0.15 V$
2.3 V to 2.7 V	$0.5V_{CC}$	$0.5V_{CC}$	$V_{OL} + 0.15 V$	$V_{OH} - 0.15 V$
2.7 V	1.5 V	1.5 V	$V_{OL} + 0.3 V$	$V_{OH} - 0.3 V$
3.0 V to 3.6 V	1.5 V	1.5 V	$V_{OL} + 0.3 V$	$V_{OH} - 0.3 V$
4.5 V to 5.5 V	$0.5V_{CC}$	$0.5V_{CC}$	$V_{OL} + 0.3 V$	$V_{OH} - 0.3 V$



Test data is given in [Table 11](#).

Definitions for test circuit:

R_T = Termination resistance should be equal to output impedance Z_o of the pulse generator.

C_L = Load capacitance including jig and probe capacitance.

R_L = Load resistance.

V_{EXT} = External voltage for measuring switching times.

Fig 19. Test circuit for measuring switching times

Table 11. Test data

Supply voltage	Input		Load		V_{EXT}		
V_{CC}	V_I	t_r, t_f	C_L	R_L	t_{PLH}, t_{PHL}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
1.65 V to 1.95 V	V_{CC}	≤ 2.0 ns	30 pF	1 k Ω	open	GND	$2V_{CC}$
2.3 V to 2.7 V	V_{CC}	≤ 2.0 ns	30 pF	500 Ω	open	GND	$2V_{CC}$
2.7 V	2.7 V	≤ 2.5 ns	50 pF	500 Ω	open	GND	6 V
3.0 V to 3.6 V	2.7 V	≤ 2.5 ns	50 pF	500 Ω	open	GND	6 V
4.5 V to 5.5 V	V_{CC}	≤ 2.5 ns	50 pF	500 Ω	open	GND	$2V_{CC}$

11.2 Additional dynamic characteristics

Table 12. Additional dynamic characteristics

At recommended operating conditions; typical values measured at $T_{amb} = 25$ °C.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
THD	total harmonic distortion	$R_L = 10$ k Ω ; $C_L = 50$ pF; $f_i = 1$ kHz; see Figure 20					
		$V_{CC} = 1.65$ V	-	0.032	-	%	
		$V_{CC} = 2.3$ V	-	0.008	-	%	
		$V_{CC} = 3.0$ V	-	0.006	-	%	
		$V_{CC} = 4.5$ V	-	0.001	-	%	
		$R_L = 10$ k Ω ; $C_L = 50$ pF; $f_i = 10$ kHz; see Figure 20					
		$V_{CC} = 1.65$ V	-	0.068	-	%	
		$V_{CC} = 2.3$ V	-	0.009	-	%	
		$V_{CC} = 3.0$ V	-	0.008	-	%	
		$V_{CC} = 4.5$ V	-	0.006	-	%	

Table 12. Additional dynamic characteristics ...continuedAt recommended operating conditions; typical values measured at $T_{amb} = 25\text{ }^{\circ}\text{C}$.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$f_{(-3\text{dB})}$	-3 dB frequency response	$R_L = 600\ \Omega$; $C_L = 50\ \text{pF}$; see Figure 21					
		$V_{CC} = 1.65\ \text{V}$	-	135	-	MHz	
		$V_{CC} = 2.3\ \text{V}$	-	145	-	MHz	
		$V_{CC} = 3.0\ \text{V}$	-	150	-	MHz	
		$V_{CC} = 4.5\ \text{V}$	-	155	-	MHz	
		$R_L = 50\ \Omega$; $C_L = 5\ \text{pF}$; see Figure 21					
		$V_{CC} = 1.65\ \text{V}$	-	> 500	-	MHz	
		$V_{CC} = 2.3\ \text{V}$	-	> 500	-	MHz	
		$V_{CC} = 3.0\ \text{V}$	-	> 500	-	MHz	
		$V_{CC} = 4.5\ \text{V}$	-	> 500	-	MHz	
		$R_L = 50\ \Omega$; $C_L = 10\ \text{pF}$; see Figure 21					
		$V_{CC} = 1.65\ \text{V}$	-	200	-	MHz	
		$V_{CC} = 2.3\ \text{V}$	-	350	-	MHz	
		$V_{CC} = 3.0\ \text{V}$	-	410	-	MHz	
$V_{CC} = 4.5\ \text{V}$	-	440	-	MHz			
α_{iso}	isolation (OFF-state)	$R_L = 600\ \Omega$; $C_L = 50\ \text{pF}$; $f_i = 1\ \text{MHz}$; see Figure 22					
		$V_{CC} = 1.65\ \text{V}$	-	-46	-	dB	
		$V_{CC} = 2.3\ \text{V}$	-	-46	-	dB	
		$V_{CC} = 3.0\ \text{V}$	-	-46	-	dB	
		$V_{CC} = 4.5\ \text{V}$	-	-46	-	dB	
		$R_L = 50\ \Omega$; $C_L = 5\ \text{pF}$; $f_i = 1\ \text{MHz}$; see Figure 22					
		$V_{CC} = 1.65\ \text{V}$	-	-37	-	dB	
		$V_{CC} = 2.3\ \text{V}$	-	-37	-	dB	
		$V_{CC} = 3.0\ \text{V}$	-	-37	-	dB	
		$V_{CC} = 4.5\ \text{V}$	-	-37	-	dB	
V_{ct}	crosstalk voltage	between digital input and switch; $R_L = 600\ \Omega$; $C_L = 50\ \text{pF}$; $f_i = 1\ \text{MHz}$; $t_r = t_f = 2\ \text{ns}$; see Figure 23					
		$V_{CC} = 1.65\ \text{V}$	-	69	-	mV	
		$V_{CC} = 2.3\ \text{V}$	-	87	-	mV	
		$V_{CC} = 3.0\ \text{V}$	-	156	-	mV	
		$V_{CC} = 4.5\ \text{V}$	-	302	-	mV	

Table 12. Additional dynamic characteristics ...continued
 At recommended operating conditions; typical values measured at $T_{amb} = 25\text{ }^{\circ}\text{C}$.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Q_{inj}	charge injection	$C_L = 0.1\text{ nF}$; $V_{gen} = 0\text{ V}$; $R_{gen} = 0\text{ }\Omega$; $f_i = 1\text{ MHz}$; $R_L = 1\text{ M}\Omega$; see Section 11				
		$V_{CC} = 1.8\text{ V}$	-	3.3	-	pC
		$V_{CC} = 2.5\text{ V}$	-	4.1	-	pC
		$V_{CC} = 3.3\text{ V}$	-	5.0	-	pC
		$V_{CC} = 4.5\text{ V}$	-	6.4	-	pC
		$V_{CC} = 5.5\text{ V}$	-	7.5	-	pC

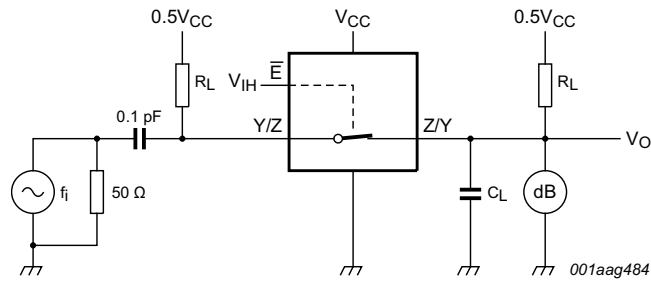
11.3 Test circuits

Test conditions:
 $V_{CC} = 1.65\text{ V}$: $V_I = 1.4\text{ V}$ (p-p).
 $V_{CC} = 2.3\text{ V}$: $V_I = 2\text{ V}$ (p-p).
 $V_{CC} = 3\text{ V}$: $V_I = 2.5\text{ V}$ (p-p).
 $V_{CC} = 4.5\text{ V}$: $V_I = 4\text{ V}$ (p-p).

Fig 20. Test circuit for measuring total harmonic distortion

Adjust f_i voltage to obtain 0 dBm level at output. Increase f_i frequency until dB meter reads -3 dB .

Fig 21. Test circuit for measuring the frequency response when switch is in ON-state



Adjust f_i voltage to obtain 0 dBm level at input.

Fig 22. Test circuit for measuring isolation (OFF-state)

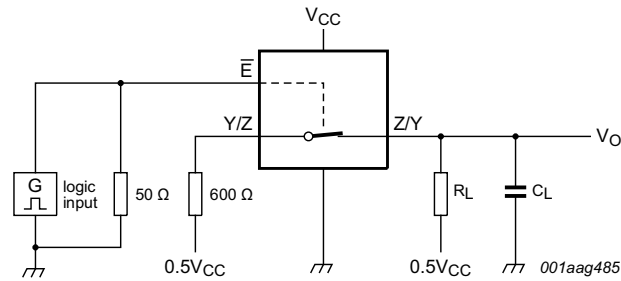
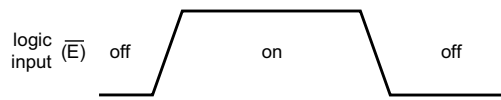
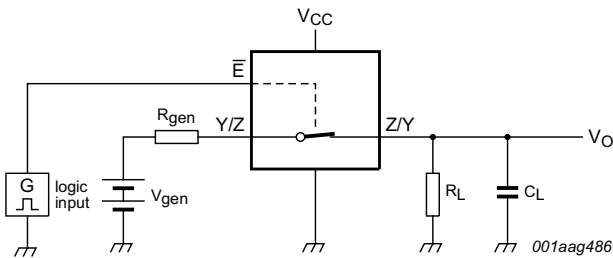


Fig 23. Test circuit for measuring crosstalk between digital inputs and switch



$Q_{inj} = \Delta V_O \times C_L$.
 ΔV_O = output voltage variation.
 R_{gen} = generator resistance.
 V_{gen} = generator voltage.

Fig 24. Test circuit for measuring charge injection

12. Package outline

TSSOP5: plastic thin shrink small outline package; 5 leads; body width 1.25 mm

SOT353-1

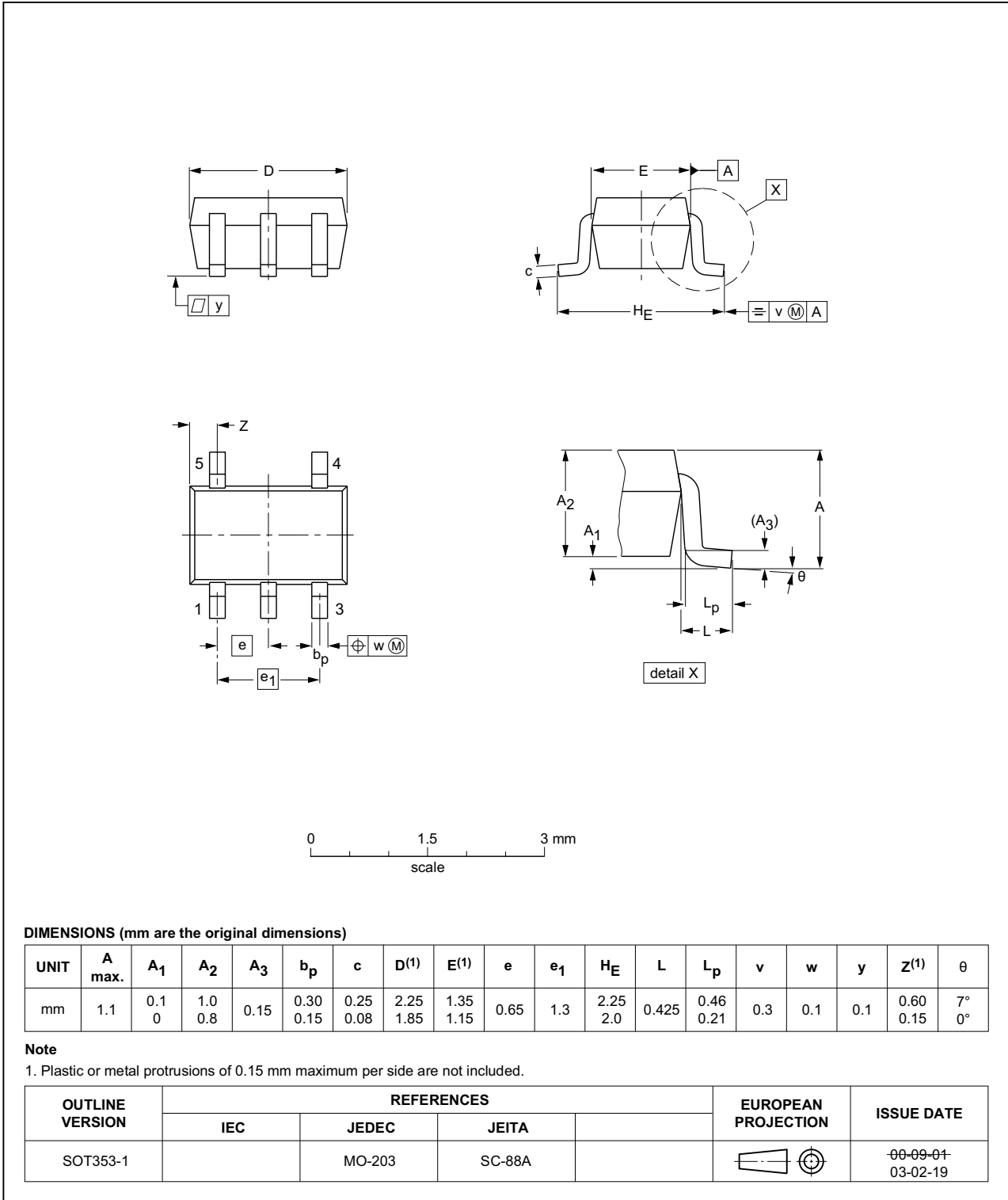


Fig 25. Package outline SOT353-1 (TSSOP5)

Plastic surface-mounted package; 5 leads

SOT753

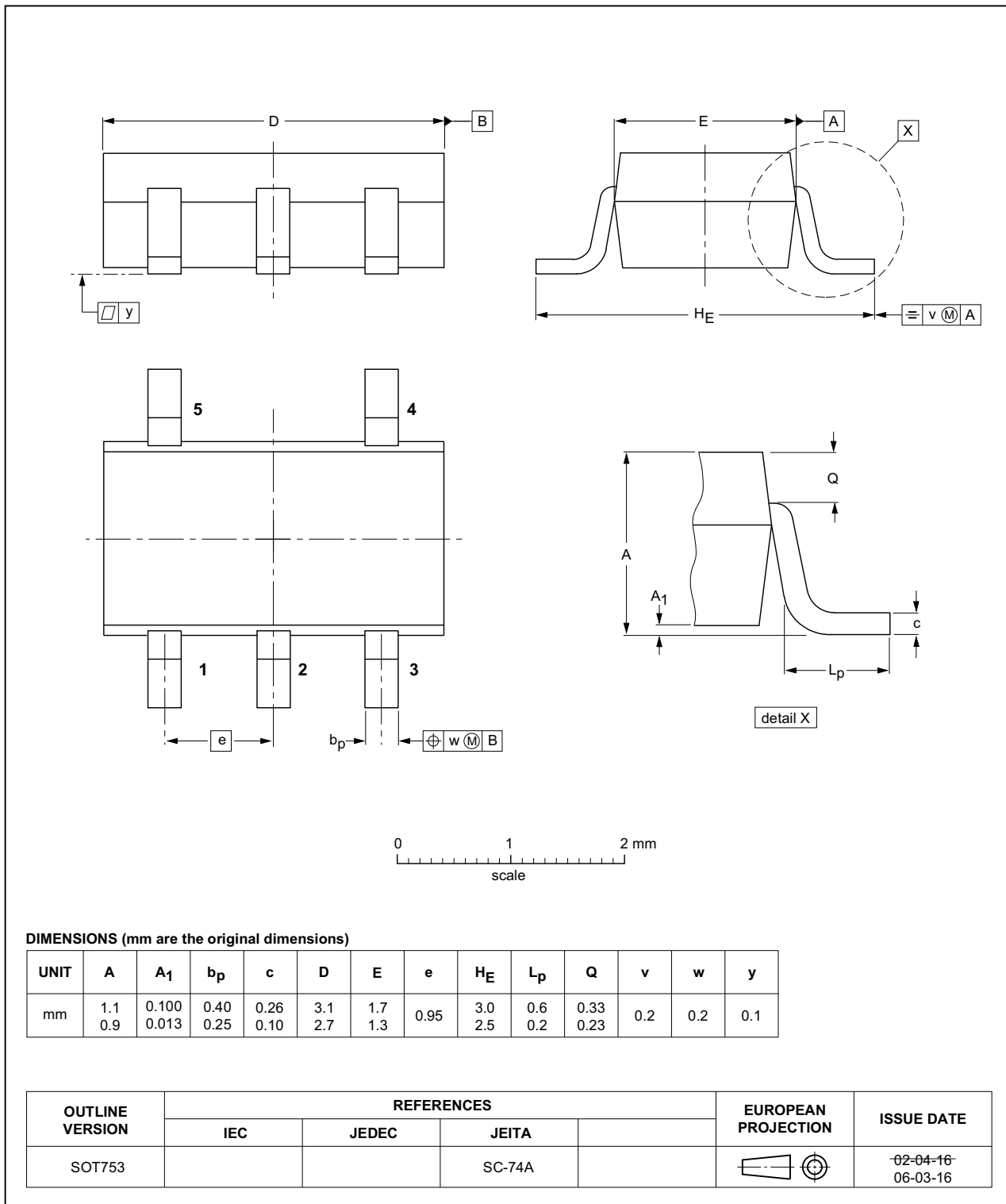


Fig 26. Package outline SOT753 (SC-74A)

XSON6: plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1.45 x 0.5 mm

SOT886

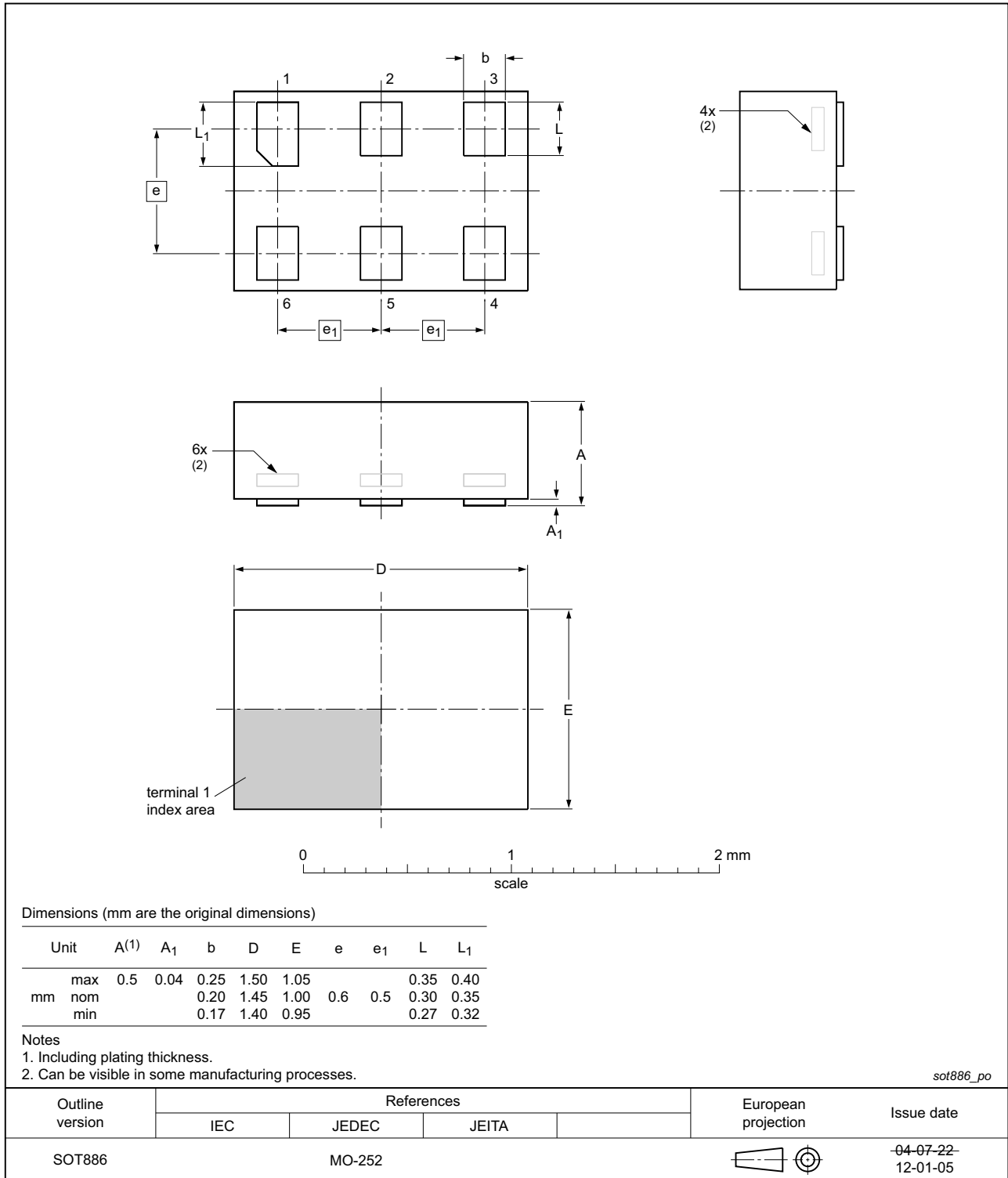


Fig 27. Package outline SOT886 (XSON6)

XSON6: plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1 x 0.5 mm

SOT891

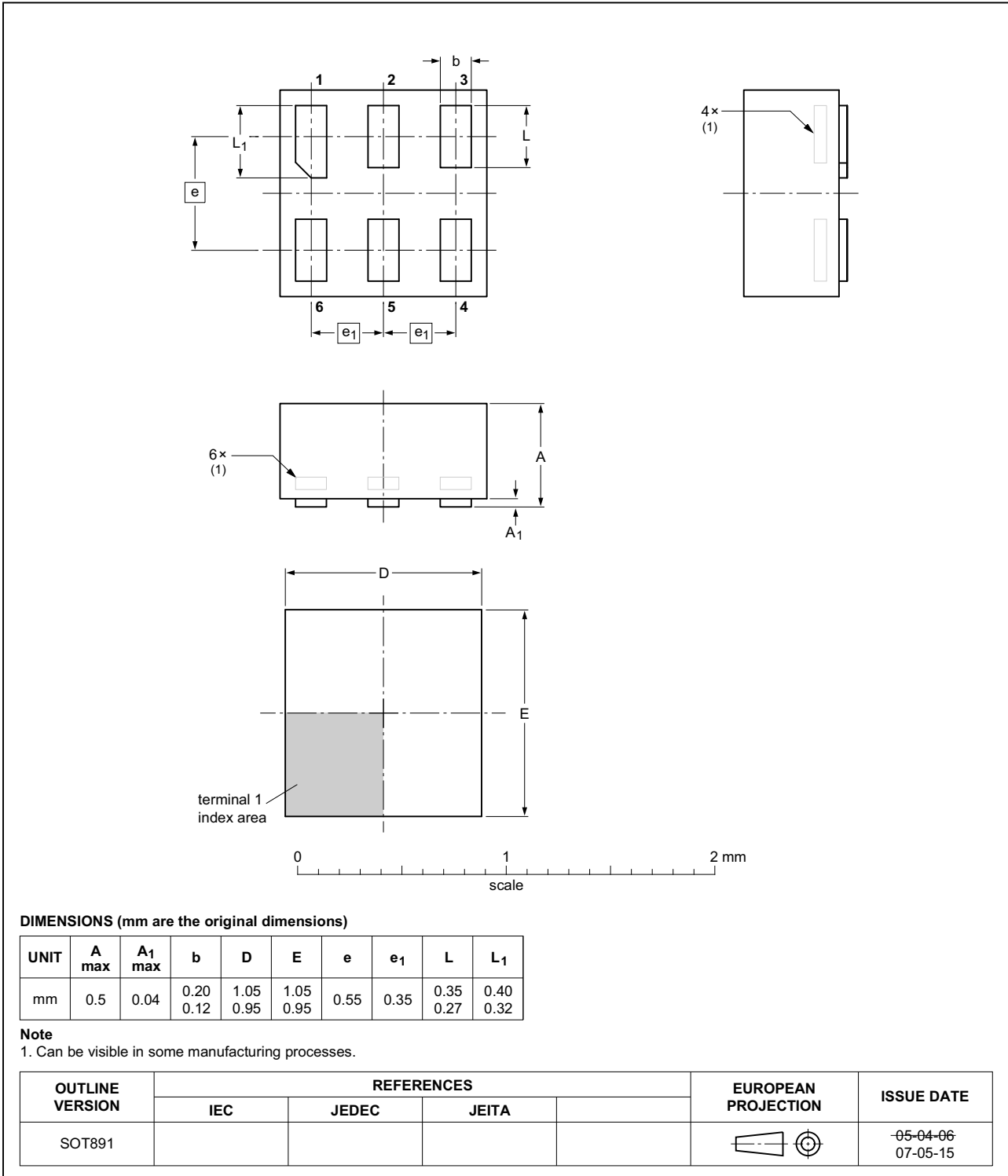


Fig 28. Package outline SOT891 (XSON6)

**XSON6: extremely thin small outline package; no leads;
6 terminals; body 0.9 x 1.0 x 0.35 mm**

SOT1115



Fig 29. Package outline SOT1115 (XSON6)

**XSON6: extremely thin small outline package; no leads;
6 terminals; body 1.0 x 1.0 x 0.35 mm**

SOT1202

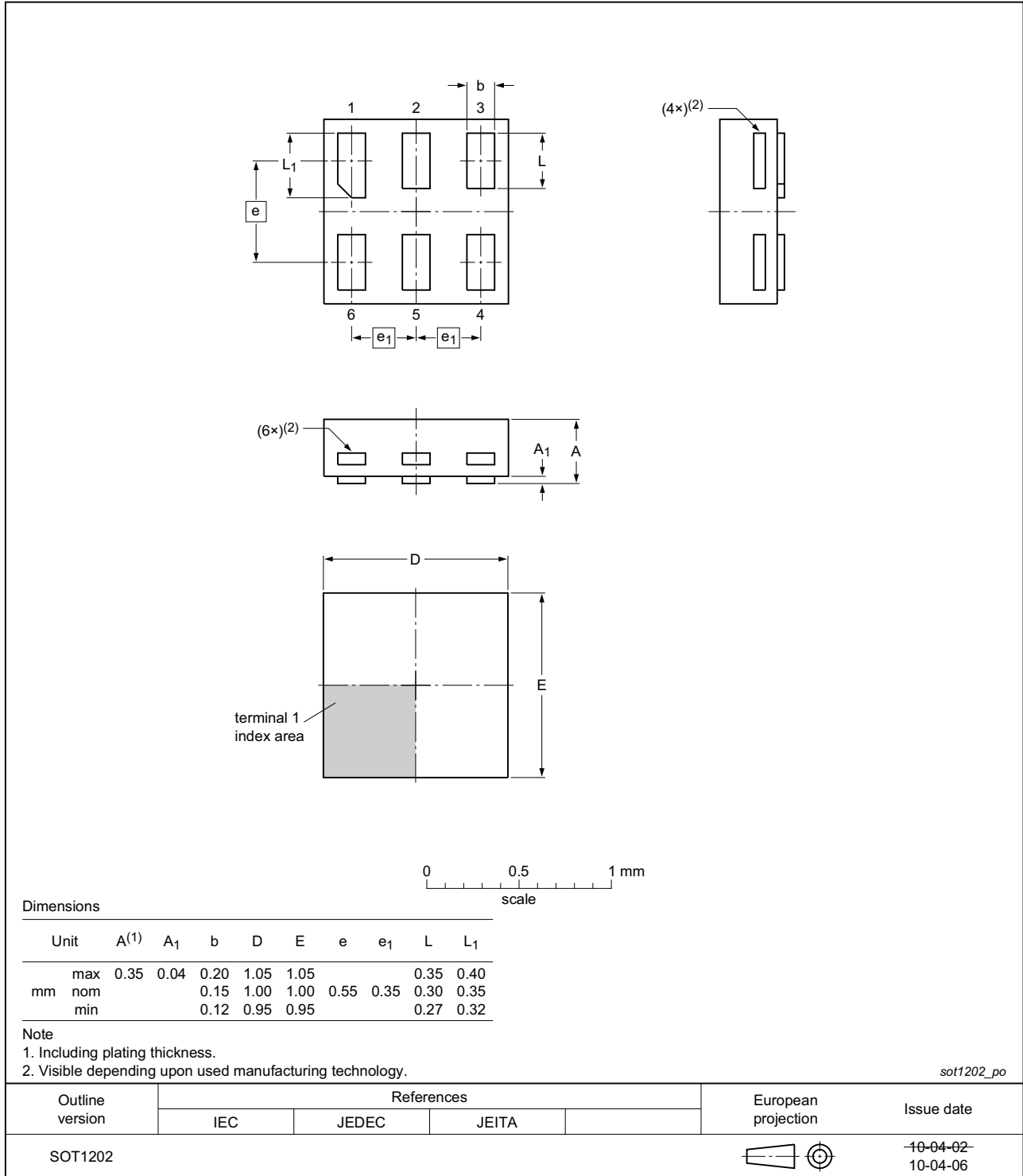


Fig 30. Package outline SOT1202 (XSON6)

X2SON5: plastic thermal enhanced extremely thin small outline package; no leads; 5 terminals; body 0.8 x 0.8 x 0.35 mm

SOT1226

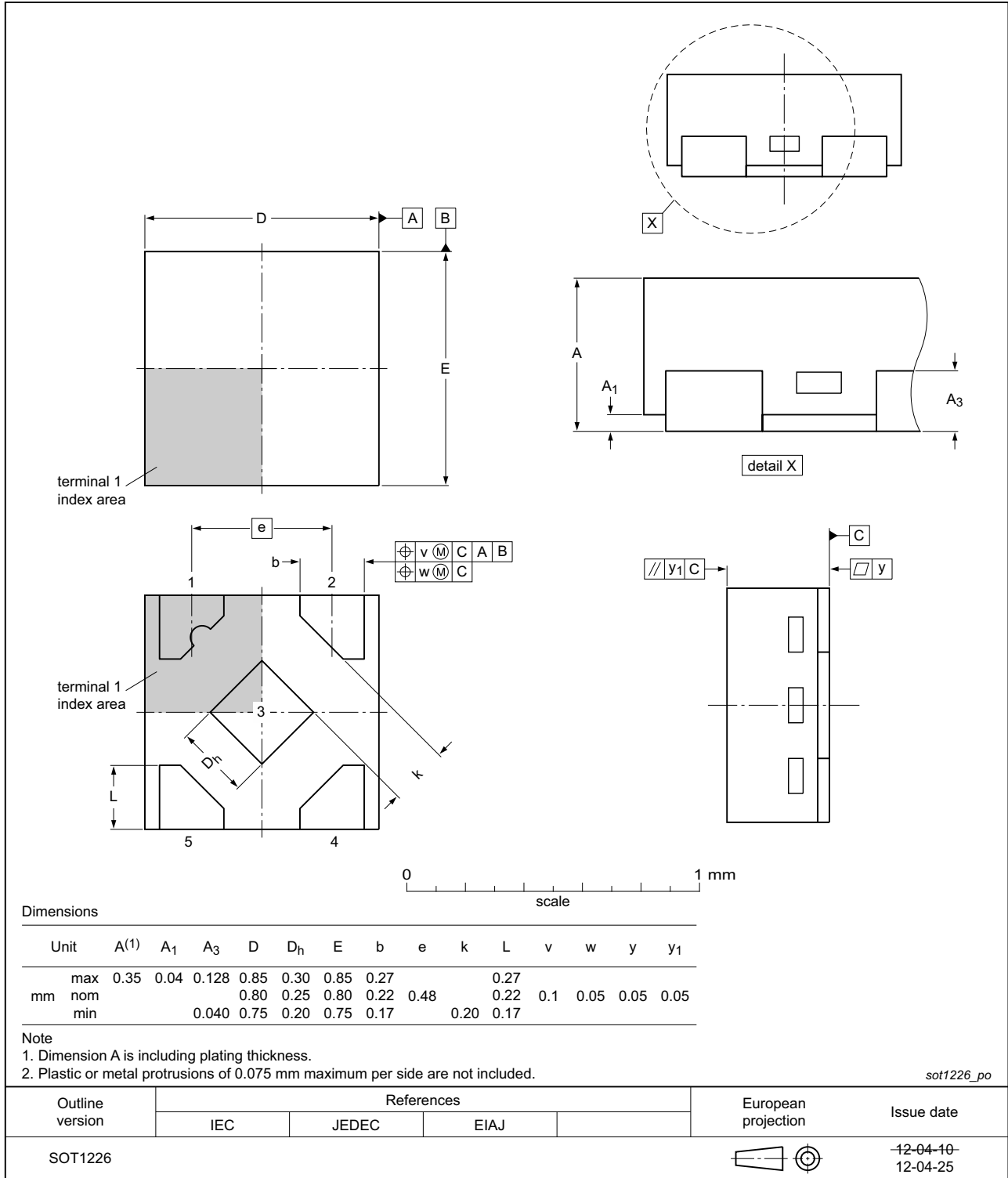


Fig 31. Package outline SOT1226 (X2SON5)

13. Abbreviations

Table 13. Abbreviations

Acronym	Description
CMOS	Complementary Metal Oxide Semiconductor
DUT	Device Under Test
ESD	ElectroStatic Discharge
HBM	Human Body Model
MM	Machine Model
TTL	Transistor-Transistor Logic

14. Revision history

Table 14. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74LVC1G384 v.7	20161207	Product data sheet	-	74LVC1G384 v.6
Modifications:	<ul style="list-style-type: none"> Table 7: The maximum limits for leakage current and supply current have changed. 			
74LVC1G384 v.6	20150903	Product data sheet	-	74LVC1G384 v.5
Modifications:	<ul style="list-style-type: none"> Added type number 74LVC1G384GX (SOT1226) 			
74LVC1G384 v.5	20150115	Product data sheet	-	74LVC1G384 v.4
Modifications:	<ul style="list-style-type: none"> SOT886 (XSON6) package outline drawing modified. 			
74LVC1G384 v.4	20111206	Product data sheet	-	74LVC1G384 v.3
Modifications:	<ul style="list-style-type: none"> Legal pages updated. 			
74LVC1G384 v.3	20101103	Product data sheet	-	74LVC1G384 v.2
74LVC1G384 v.2	20070829	Product data sheet	-	74LVC1G384 v.1
74LVC1G384 v.1	20040226	Product data	-	-

15. Legal information

15.1 Data sheet status

Document status ^{[1][2]}	Product status ^[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nexperia.com>.

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