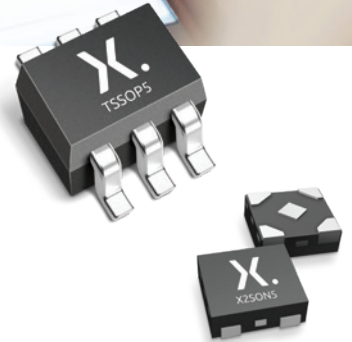


Single supply logic gates with voltage translation



Our 74LV1Txxx logic family provides solutions that integrate voltage level translation with a Boolean function. 74LV1Txxx types are single 1.6 V to 5.5 V supply general-purpose voltage translating devices. Our 74LV1Txxx family is currently composed of ten logic functions including buffers, inverters and gates (AND, OR, NAND, NOR, EXCLUSIVE-OR, EXCLUSIVE-NOR).



Our 74LV1Txxx family provides single-supply translation using overvoltage-tolerant, low-threshold inputs. The output level is always referenced to V_{cc} , which can range from 1.6 V to 5.5 V. For $V_{cc} = 3.3$ V, input logic signals from systems at 1.8 V to 5.5 V are valid. This wide V_{cc} range allows interconnection between systems at most of the different logic signal levels. 74LV1Txxx has a low-noise balanced output drive capability of 8 mA reducing line reflections, overshoot and undershoot.

Key Features

- › Wide supply voltage range 1.6 V to 5.5 V
- › Up and down translation possible
- › Overvoltage tolerant inputs
- › Up to 50 MHz operation at 3.3 V

Applications

- › Portable devices
- › Industrial controllers
- › Servers, PC & Notebooks
- › Automotive

Benefits

- › No external pull-up or pull down resistors required
- › Integration of logic function with translation saves device count and PCB space
- › Footprint-compatible with existing non-translating devices
- › Low dynamic power consumption increasing battery longevity
- › Available in smallest package for use without step-down mask (X2SON5)

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Translation properties

Translation	V _{CC} (V)	Input system supply (V)	Output system supply (V)
Up	1.8	1.2	1.8
	2.5	1.5	2.5
	3.3	1.8	3.3
	5.0	3.3	5.0
Down	1.8	3.3	1.8
	2.5	3.3	2.5
	3.3	5.0	3.3



Available types

Type	
74LV1T00	2-input NAND gate
74LV1T02	2-input NOR gate
74LV1T04	Inverter
74LV1T08	2-input AND gate
74LV1T32	2-input OR gate
74LV1T34	Buffer
74LV1T86	2-input XOR gate
74LV1T87	2-input XNOR gate
74LV1T125	Buffer / line driver; 3-state
74LV1T126	Buffer / line driver; 3-state

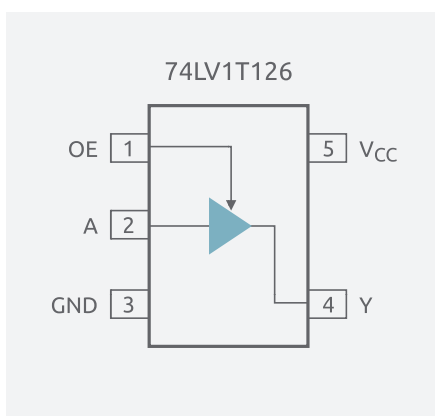
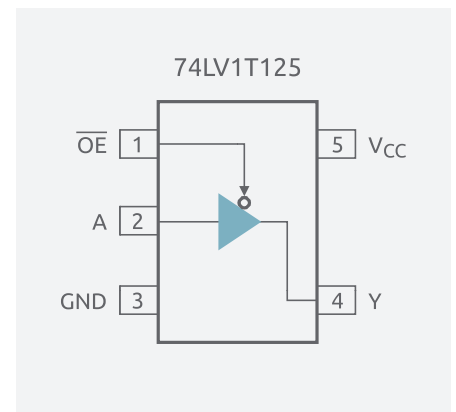
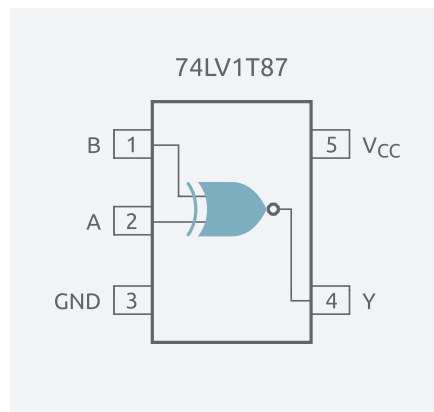
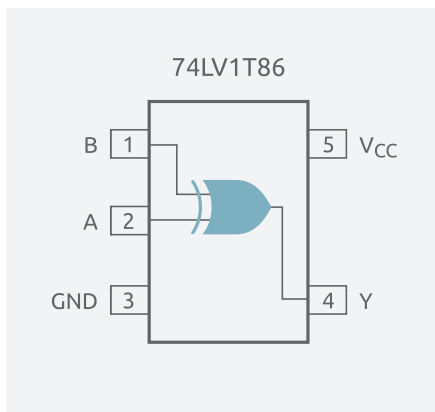
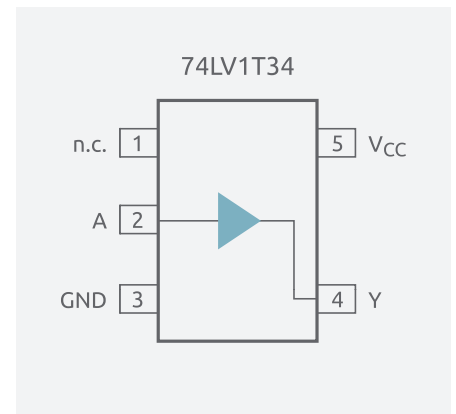
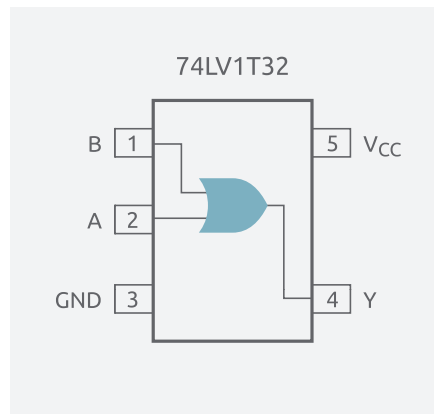
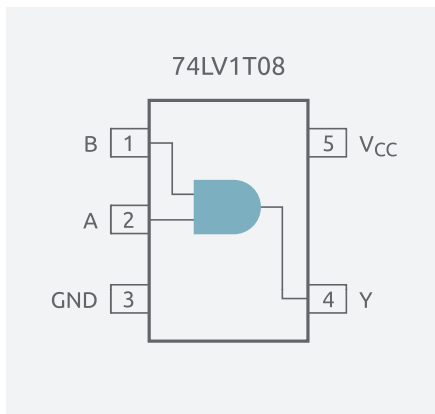
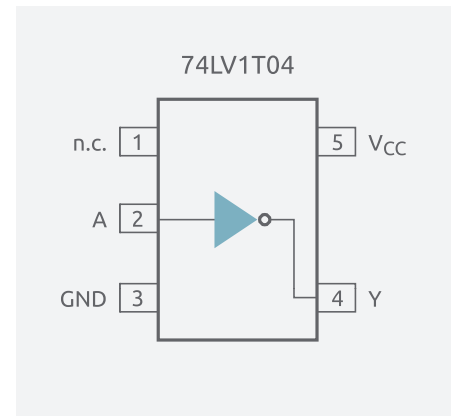
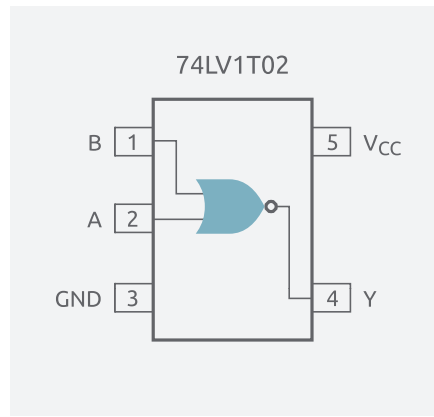
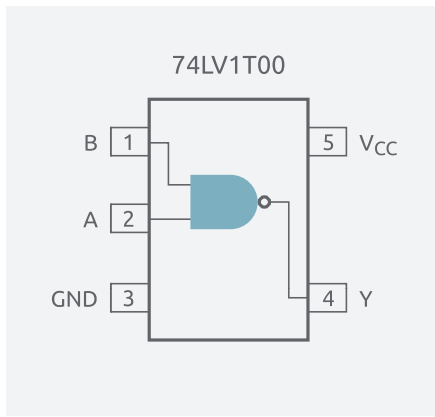
Parametrics

Type	V _{CC} Range	Output Drive	Prop Delay (t _{pd})	Temperature Range	Static Current (I _{CC})
LV1Txxx	1.6 – 5.5 V	+/- 8 mA	< 5.0 ns	-40 ~125 °C	< 0.1 µA (typ.)

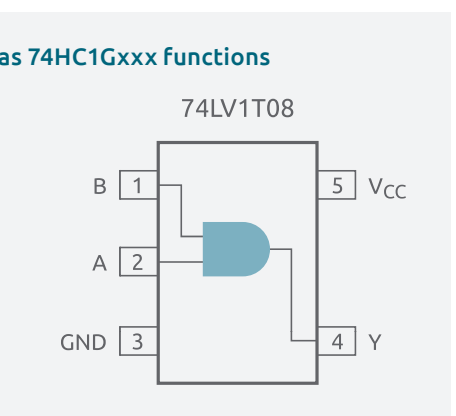
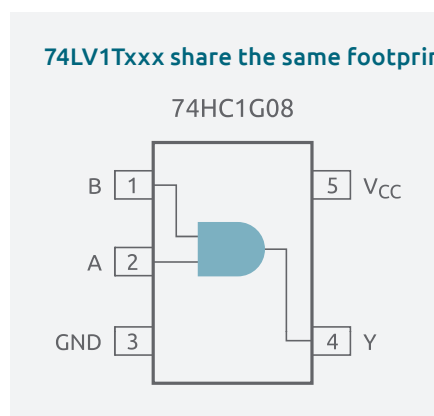
Packages

Suffix	Package version	Package name	Dimensions (L x W x H, pitch - in mm)	
GW	SOT353-1	TSSOP5	2.0 x 2.1 x 1.0, 0.65	
GX	SOT1226	X2SON5	0.8 x 0.8 x 0.35, 0.48	

Functional diagrams



74LV1Txxx share the same footprint as 74HC1Gxxx functions

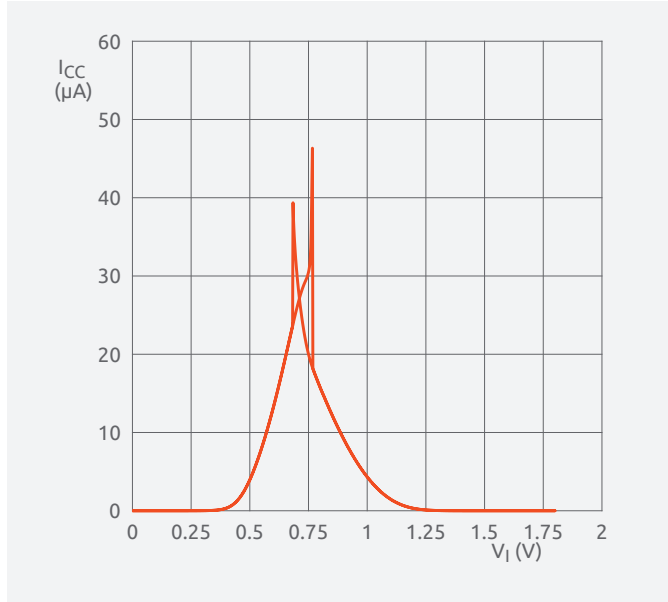


Overvoltage tolerant inputs

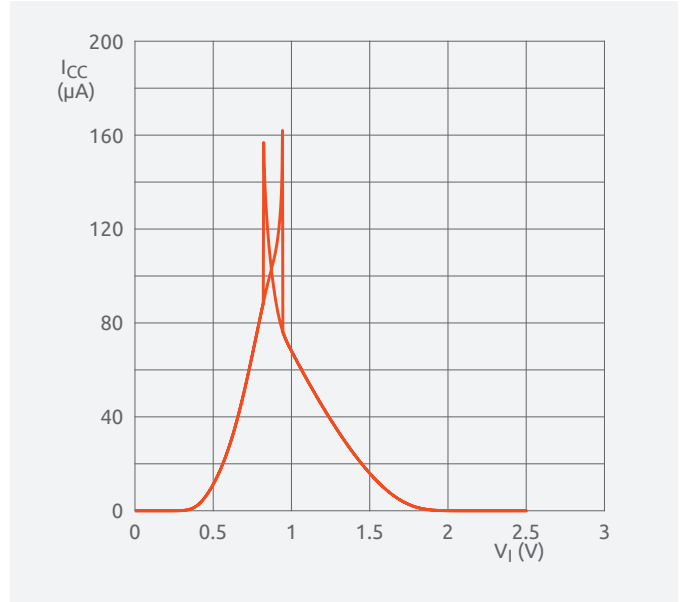
74LV1Txxx series has overvoltage tolerant inputs, which do not have input clamp diodes to V_{CC} and can be used to interface to higher-voltage systems without using external current-limiting resistors, effectively reducing BOM and cost.

Input characteristics

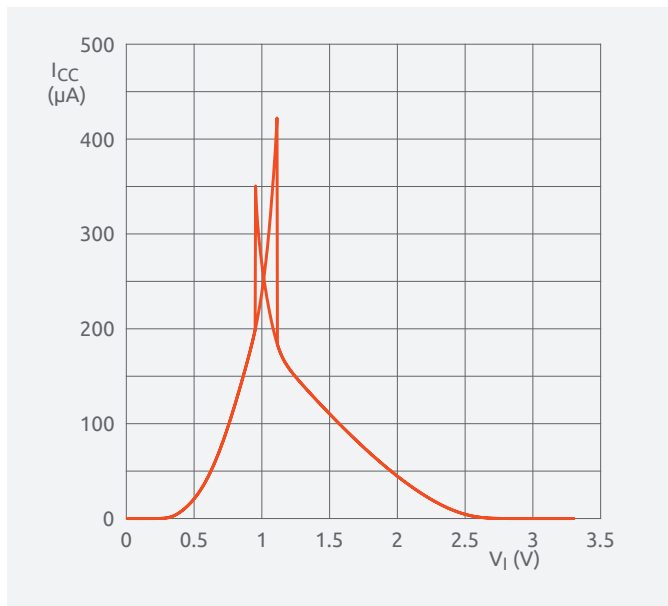
These devices have input-switching thresholds lower than the typical $V_{CC}/2$ value of CMOS and can be used for low-to-high voltage level translation. Schmitt action is included to provide hysteresis, preventing false switching and ensuring well-defined outputs when driven by slowly transitioning signals.



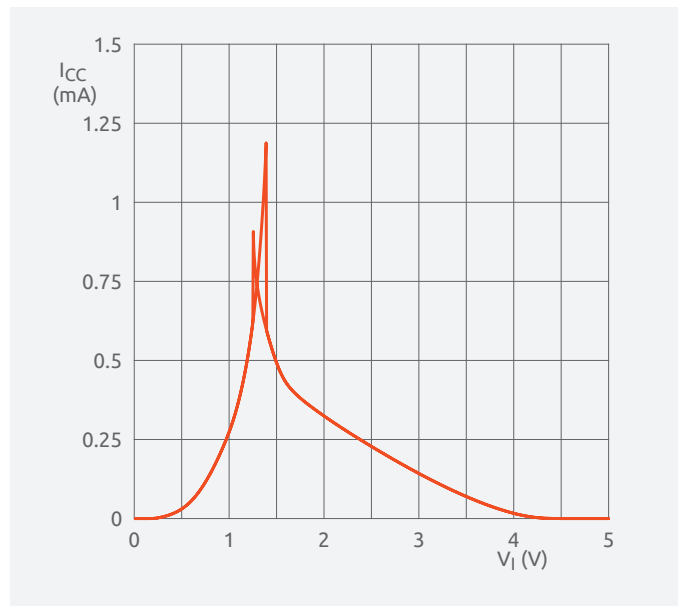
$V_{CC} = 1.8V$



$V_{CC} = 2.5V$

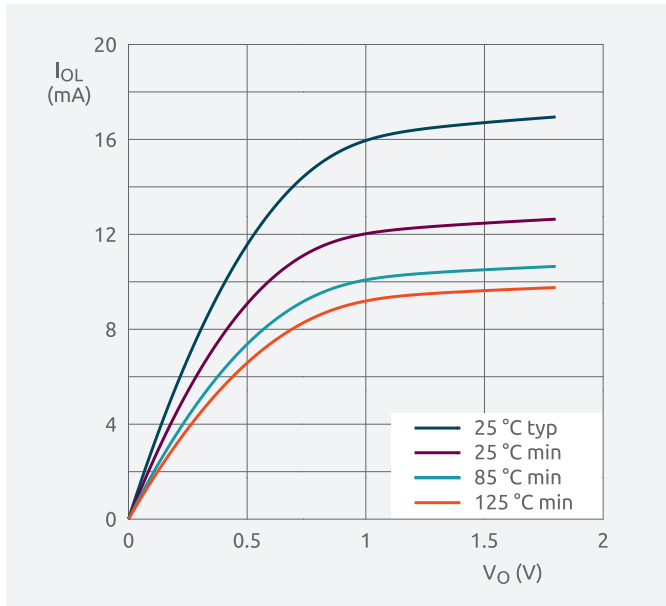


$V_{CC} = 3.3V$

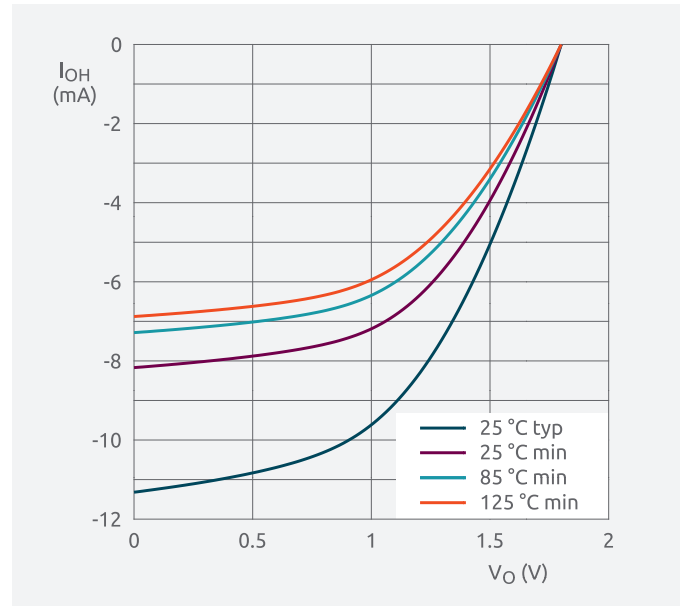


$V_{CC} = 5V$

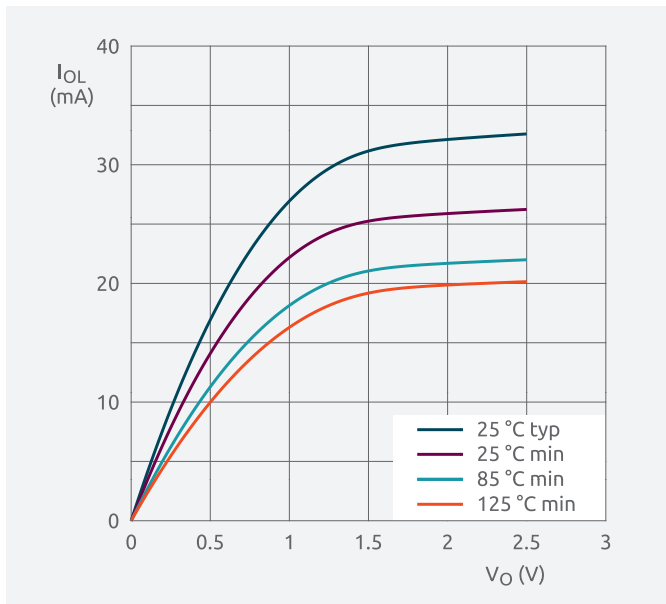
Output characteristics



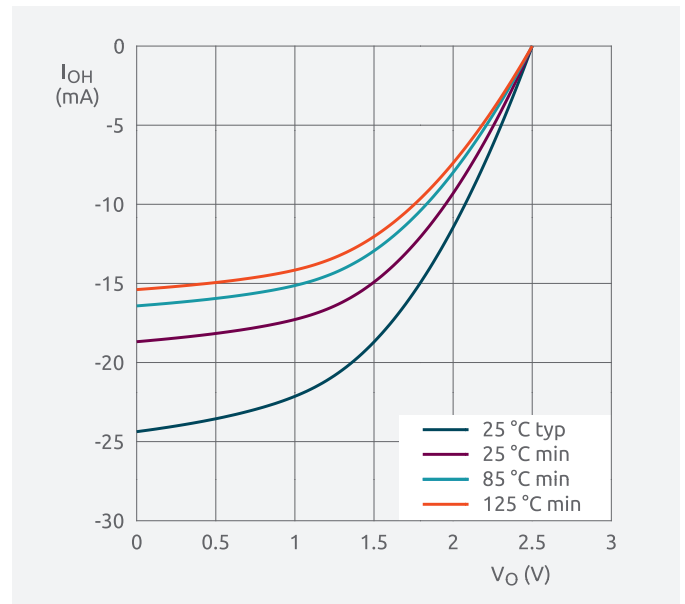
$V_{CC} = 1.8$ V, output driving LOW



$V_{CC} = 1.8$ V, output driving HIGH

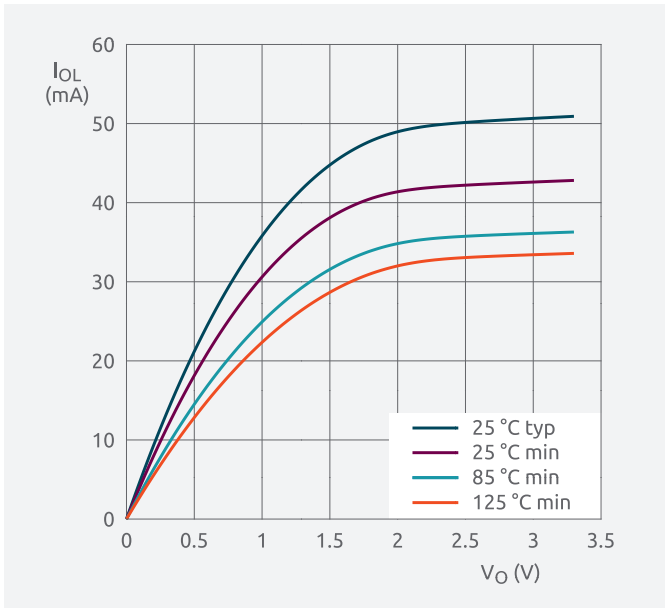


$V_{CC} = 2.5$ V, output driving LOW

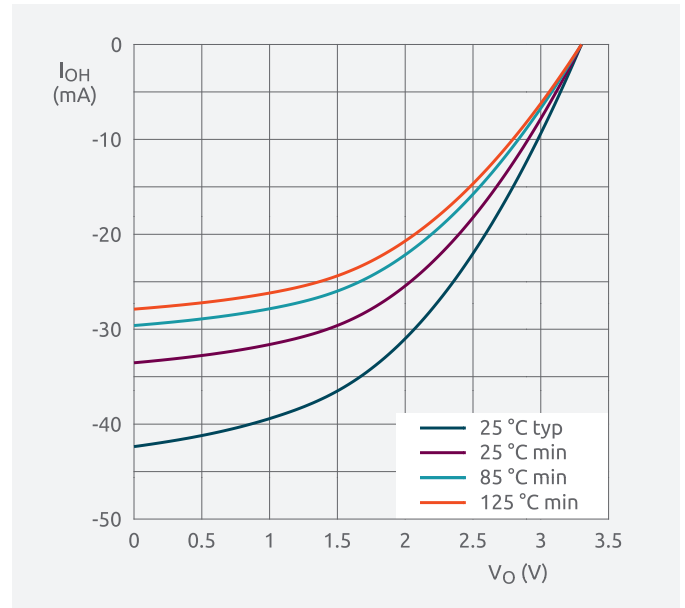


$V_{CC} = 2.5$ V, output driving HIGH

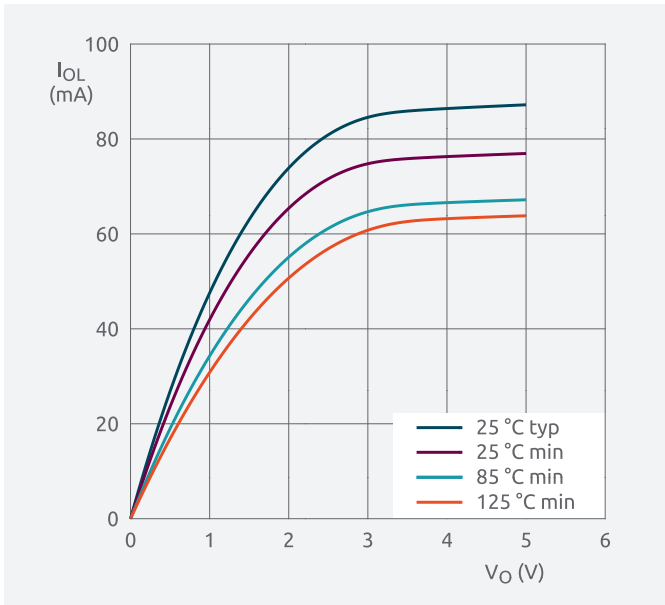
Output characteristics



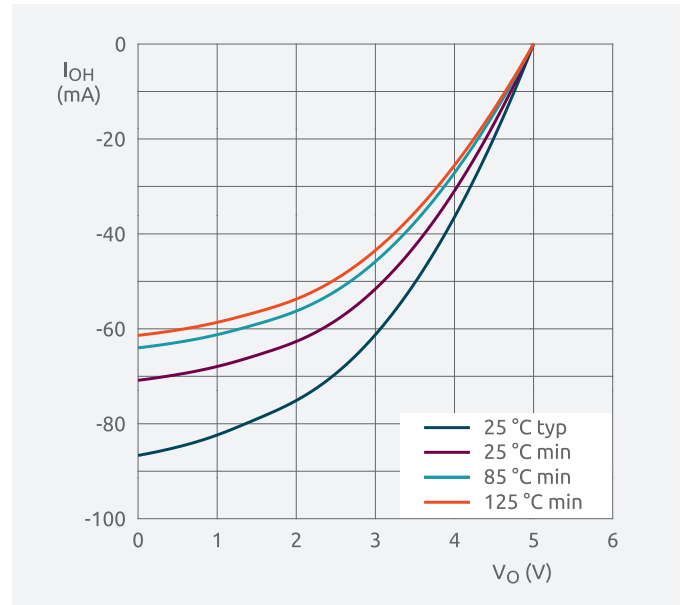
$V_{CC} = 3.3 \text{ V}$, output driving LOW



$V_{CC} = 3.3 \text{ V}$, output driving HIGH



$V_{CC} = 5 \text{ V}$, output driving LOW



$V_{CC} = 5 \text{ V}$, output driving HIGH

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