



## NXP's low-Ohmic switches, the NX3 family

# Low-Ohmic switches

## $R_{ON}$ value of 0.75 $\Omega$ , 0.45 $\Omega$

These best in class low-Ohmic switches are an excellent choice for audio and mixed-signal applications in small, portable devices. Our NX3xxT products feature low-switching threshold levels, making them ideal for interfacing with ASICs and other circuits requiring switching level translation.

### Key features

- ▶ Low  $R_{ON}$  (L series = 0.75  $\Omega$ , V series = 0.45  $\Omega$ )
- ▶  $R_{ON}$  flatness (0.1  $\Omega$  typ)
- ▶ Wide supply range (1.4 to 3.6 V)
- ▶ High current handling (up to 350 mA continuous)
- ▶ Low leakage (<50 nA at 85 °C)
- ▶ Break-before-make switching
- ▶ Over voltage-tolerant control inputs
- ▶ Low-threshold input variants
- ▶ Excellent ESD performance (7.5 kV HBM)
- ▶ Fully specified (-40 to +85 and -40 to +125 °C)
- ▶ Pb-free, RoHS and Dark Green compliant
- ▶ PicoGate and MicroPak™ packages

### Benefits

- ▶ Reduced signal attenuation and distortion
- ▶ Longer battery life
- ▶ Lower chip count
- ▶ Easier placement in tight layouts

### Applications

- ▶ Cellular handsets and smartphones
- ▶ MP3 players and mobile video players
- ▶ DSCs and digital camcorders
- ▶ Portable handhelds (PDAs, GPS devices, notebook PCs)
- ▶ Consumer entertainment (LCD TVs, DVD+R/W systems, STBs)
- ▶ Portable instrumentation

The combination of low ON resistance and low  $R_{ON}$  flatness provided in the NX3 family greatly reduces switched signal attenuation and distortion, thus eliminating the need for buffer amplifiers in many applications. When switching 2 V audio signals to a 32  $\Omega$  speaker the NX3L series has a typical attenuation of 0.13 dB and typical distortion of 0.024% at  $V_{CC} = 2.7$  V. Under the same conditions the NX3V series has a typical attenuation of 0.07 dB and distortion of 0.01%. Due to its lower  $R_{ON}$  and relatively high continuous current capability (350 mA), the NX3V series is also suitable for use in power management applications.

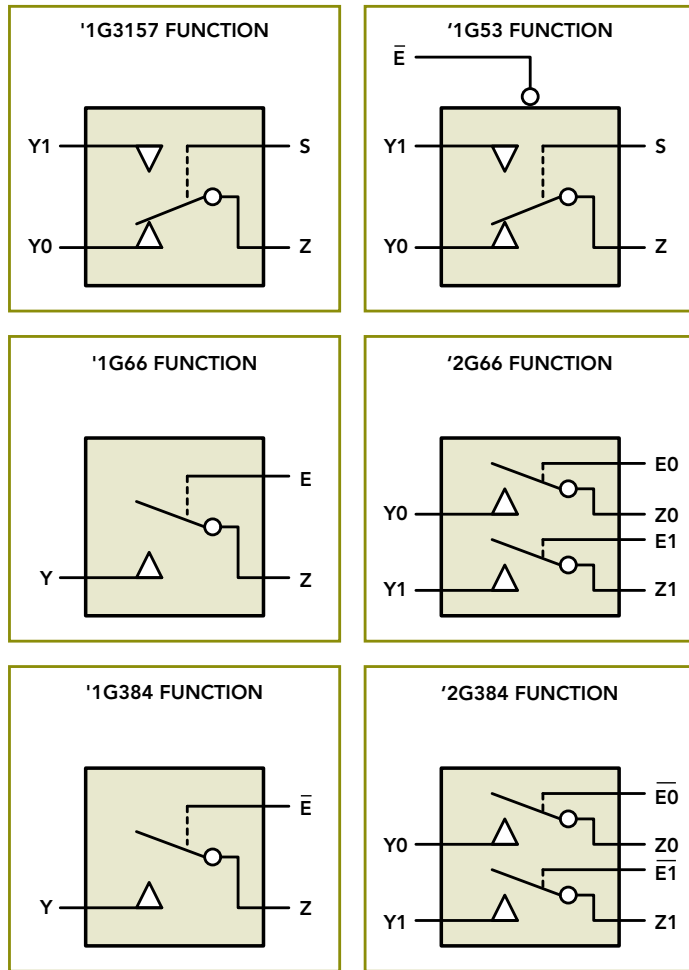
The switches are fabricated in a 0.35  $\mu\text{m}$  CMOS technology that delivers very low static and dynamic power dissipation. A wide  $V_{\text{CC}}$  range (1.4 to 3.6 V), combined with low leakage, extends usable battery life for even more efficient operation.

Low power consumption makes the NX3 family especially well suited for portable applications, including cellular handsets, personal media players, PDAs, GPS devices, and notebook PCs. The very low switch leakage 50 nA also makes the NX3 family ideal for monitoring applications.

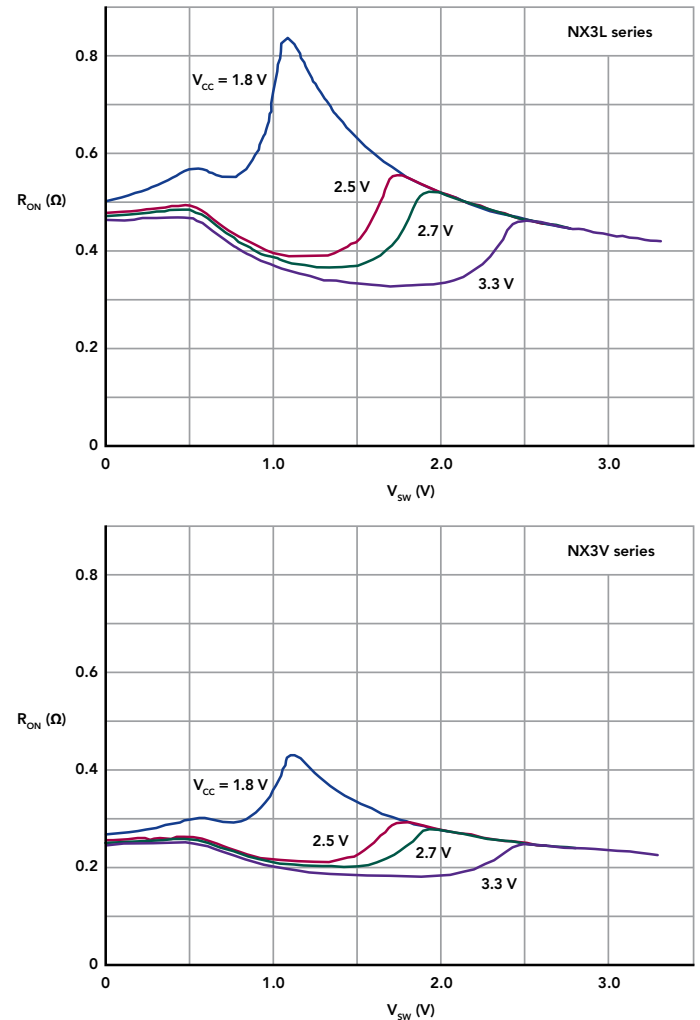
To make the NX3 family tolerant to slower input rise and fall times (200 ns/V) the inputs contain Schmitt trigger action. Additionally, to support mixed-voltage switch applications, the NX3xxT products have control pins with a low-threshold input level. This allows a 1.8 V controller to drive a 3.3 V switch without any external translator devices.

The ultra-compact MicroPak™ packages greatly improve placement and routing, so the switches are easier to place in applications where board space and headroom are at a premium.

### Low-Ohmic switch functions









### Typical ON resistance as a function of input voltage



## NX3 product family

| Part Number  | Function | R <sub>ON</sub> (max) Ω |       | Low threshold | R <sub>ON</sub> |          | Package types | Package drawing |
|--------------|----------|-------------------------|-------|---------------|-----------------|----------|---------------|-----------------|
|              |          | 1.65 V                  | 2.7 V |               | Low             | Very low |               |                 |
| NX3L1G3157GM | 1 x SPDT | 2                       | 0.75  |               | •               |          | MicroPak 6L   | SOT886          |
| NX3L1T3157GM | 1 x SPDT | 2                       | 0.75  | •             | •               |          | MicroPak 6L   | SOT886          |
| NX3L1G3157GW | 1 x SPDT | 2                       | 0.75  |               | •               |          | PicoGate 6L   | SOT363          |
| NX3L1T3157GW | 1 x SPDT | 2                       | 0.75  | •             | •               |          | PicoGate 6L   | SOT363          |
| NX3L1G666GM  | 1 x SPST | 2                       | 0.75  |               | •               |          | MicroPak 6L   | SOT886          |
| NX3L1T666GM  | 1 x SPST | 2                       | 0.75  | •             | •               |          | MicroPak 6L   | SOT886          |
| NX3V1G666GM  | 1 x SPST | 1                       | 0.45  |               |                 | •        | MicroPak 6L   | SOT886          |
| NX3V1T666GM  | 1 x SPST | 1                       | 0.45  | •             |                 | •        | MicroPak 6L   | SOT886          |
| NX3L1G666GW  | 1 x SPST | 2                       | 0.75  |               | •               |          | PicoGate 5L   | SOT353          |
| NX3L1T666GW  | 1 x SPST | 2                       | 0.75  | •             | •               |          | PicoGate 5L   | SOT353          |
| NX3V1G666GW  | 1 x SPST | 1                       | 0.45  |               |                 | •        | PicoGate 5L   | SOT353          |
| NX3V1T666GW  | 1 x SPST | 1                       | 0.45  | •             |                 | •        | PicoGate 5L   | SOT353          |
| NX3L1G384GM  | 1 x SPST | 2                       | 0.75  |               | •               |          | MicroPak 6L   | SOT886          |
| NX3L1T384GM  | 1 x SPST | 2                       | 0.75  | •             | •               |          | MicroPak 6L   | SOT886          |
| NX3V1G384GM  | 1 x SPST | 1                       | 0.45  |               |                 | •        | MicroPak 6L   | SOT886          |
| NX3V1T384GM  | 1 x SPST | 1                       | 0.45  | •             |                 | •        | MicroPak 6L   | SOT886          |
| NX3L1G384GW  | 1 x SPST | 2                       | 0.75  |               | •               |          | PicoGate 5L   | SOT353          |
| NX3L1T384GW  | 1 x SPST | 2                       | 0.75  | •             | •               |          | PicoGate 5L   | SOT353          |
| NX3V1G384GW  | 1 x SPST | 1                       | 0.45  |               |                 | •        | PicoGate 5L   | SOT353          |
| NX3V1T384GW  | 1 x SPST | 1                       | 0.45  | •             |                 | •        | PicoGate 5L   | SOT353          |
| NX3L1G53GT   | 1 x SPDT | 2                       | 0.75  |               | •               |          | MicroPak 8L   | SOT833          |
| NX3L1G53GM   | 1 x SPDT | 2                       | 0.75  |               | •               |          | MicroPak 8L   | SOT902          |
| NX3L1G53GD   | 1 x SPDT | 2                       | 0.75  |               | •               |          | XSON8         | SOT996          |
| NX3L1T53GT   | 1 x SPDT | 2                       | 0.75  | •             |                 |          | MicroPak 8L   | SOT833          |
| NX3L1T53GM   | 1 x SPDT | 2                       | 0.75  | •             |                 |          | MicroPak 8L   | SOT902          |
| NX3L1T53GD   | 1 x SPDT | 2                       | 0.75  | •             |                 |          | XSON8         | SOT996          |
| NX3L2G66GT   | 2 x SPST | 2                       | 0.75  |               | •               |          | MicroPak 8L   | SOT833          |
| NX3L2G66GM   | 2 x SPST | 2                       | 0.75  |               | •               |          | MicroPak 8L   | SOT902          |
| NX3L2G66GD   | 2 x SPST | 2                       | 0.75  |               | •               |          | XSON8         | SOT996          |
| NX3L2T66GT   | 2 x SPST | 2                       | 0.75  | •             | •               |          | MicroPak 8L   | SOT833          |
| NX3L2T66GM   | 2 x SPST | 2                       | 0.75  | •             | •               |          | MicroPak 8L   | SOT902          |
| NX3L2T66GD   | 2 x SPST | 2                       | 0.75  | •             | •               |          | XSON8         | SOT996          |
| NX3L2G384GT  | 2 x SPST | 2                       | 0.75  |               | •               |          | MicroPak 8L   | SOT833          |
| NX3L2G384GM  | 2 x SPST | 2                       | 0.75  |               | •               |          | MicroPak 8L   | SOT902          |
| NX3L2G384GD  | 2 x SPST | 2                       | 0.75  |               | •               |          | XSON8         | SOT996          |
| NX3L2T384GT  | 2 x SPST | 2                       | 0.75  | •             | •               |          | MicroPak 8L   | SOT833          |
| NX3L2T384GM  | 2 x SPST | 2                       | 0.75  | •             | •               |          | MicroPak 8L   | SOT902          |
| NX3L2T384GD  | 2 x SPST | 2                       | 0.75  | •             | •               |          | XSON8         | SOT996          |

## NX3 packages

| Package suffix | GW  | GW  | GM  | GT   | GM  | GD  |
|----------------|---|---|---|--|---|---|
|                | 5-pin   | 6-pin   | 6-pin   | 8-pin  | 8-pin   | 8-pin   |
|                |  |  |  |  |  |  |
|                | SOT353  | SOT363  | SOT886  | SOT883   | SOT902  | SOT996  |
|                | 5-pin   | 6-pin   | 6-pin   | 8-pin  | 8-pin   | 8-pin   |
| Width (mm)     | 2.1   | 2.1   | 1.00  | 1.00   | 1.60  | 3.00  |
| Length (mm)    | 2.0   | 2.0   | 1.45  | 1.95   | 1.60  | 2.00  |
| Pitch (mm)     | 0.65  | 0.65  | 0.50  | 0.50   | 0.50  | 0.50  |

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