



## Si3850ADV vs. Si3850DV

**Description:** Complementary MOSFET Half-Bridge (N- and P-Channel)

**Package:** TSOP-6

**Pin Out:** Identical

### Part Number Replacements

Si3850ADV-T1-E3 Replaces Si3850DV-T1-E3

Si3850ADV-T1-E3 Replaces Si3850DV-T1

| ABSOLUTE MAXIMUM RATINGS T <sub>A</sub> = 25 °C, unless otherwise noted |                        |                 |                                     |        |             |             |      |
|-------------------------------------------------------------------------|------------------------|-----------------|-------------------------------------|--------|-------------|-------------|------|
| Parameter                                                               |                        |                 | Symbol                              |        | Si3850ADV   | Si3580DV    | Unit |
| Drain-Source Voltage                                                    |                        |                 | V <sub>DS</sub>                     | N-Ch   | 20          | 20          | V    |
|                                                                         |                        |                 |                                     | P-Ch   | - 20        | - 20        |      |
| Gate-Source Voltage                                                     |                        |                 | V <sub>GS</sub>                     | N-Ch   | ± 12        | ± 12        |      |
|                                                                         |                        |                 |                                     | P-Ch   | ± 12        | ± 12        |      |
| Continuous Drain Current                                                | T <sub>A</sub> = 25 °C | I <sub>D</sub>  | N-Ch                                | 1.4    | 1.2         | A           |      |
|                                                                         |                        |                 | P-Ch                                | - 0.96 | - 0.85      |             |      |
|                                                                         | T <sub>A</sub> = 70 °C |                 | N-Ch                                | 1.1    | 0.95        |             |      |
|                                                                         |                        |                 | P-Ch                                | - 0.77 | - 0.65      |             |      |
| Pulsed Drain Current                                                    |                        | I <sub>DM</sub> | N-Ch                                | 3.5    | 3.5         |             |      |
|                                                                         |                        |                 | P-Ch                                | - 2.0  | - 2.5       |             |      |
| Continuous Source Current<br>(MOSFET Diode Conduction)                  |                        | I <sub>S</sub>  | N-Ch                                | 0.9    | 1           |             |      |
|                                                                         |                        |                 | P-Ch                                | - 0.9  | - 1         |             |      |
| Power Dissipation                                                       | T <sub>A</sub> = 25 °C | P <sub>D</sub>  |                                     | 1.08   | 1.25        | W           |      |
|                                                                         | T <sub>A</sub> = 70 °C |                 |                                     | 0.7    | 0.8         |             |      |
| Operating Junction and Storage Temperature Range                        |                        |                 | T <sub>J</sub> and T <sub>stg</sub> |        | - 55 to 150 | - 55 to 150 | °C   |
| Maximum Junction-to-Ambient                                             |                        |                 | R <sub>thJA</sub>                   |        | 115         | 100         | °C/W |

# Specification Comparison

Vishay Siliconix



| SPECIFICATIONS T <sub>J</sub> = 25 °C, unless otherwise noted |                           |                     |           |       |       |          |       |      |       |    |
|---------------------------------------------------------------|---------------------------|---------------------|-----------|-------|-------|----------|-------|------|-------|----|
| Parameter                                                     |                           | Symbol              | Si3850ADV |       |       | Si3850DV |       |      | Unit  |    |
|                                                               |                           |                     | Min       | Typ   | Max   | Min      | Typ   | Max  |       |    |
| Static                                                        |                           |                     |           |       |       |          |       |      |       |    |
| Gate-Threshold Voltage                                        |                           | V <sub>GS(th)</sub> | N-Ch      | 0.6   |       | 1.5      | 0.6   |      | 1.5   | V  |
|                                                               |                           |                     | P-Ch      | - 0.6 |       | - 1.5    | - 0.6 |      | - 1.5 |    |
| Gate-Body Leakage                                             |                           | I <sub>GSS</sub>    | N-Ch      |       |       | ± 100    |       |      | ± 100 | nA |
|                                                               |                           |                     | P-Ch      |       |       | ± 100    |       |      | ± 100 |    |
| Zero Gate Voltage Drain Current                               |                           | I <sub>DSS</sub>    | N-Ch      |       |       | 1        |       |      | 1     | μA |
|                                                               |                           |                     | P-Ch      |       |       | - 1      |       |      | - 1   |    |
| On-State Drain Current                                        | V <sub>GS</sub> = 4.5 V   | I <sub>D(on)</sub>  | N-Ch      | 3.0   |       |          | 3.0   |      |       | A  |
|                                                               | V <sub>GS</sub> = - 4.5 V |                     | P-Ch      | - 1.5 |       |          | - 2.0 |      |       |    |
| Drain-Source<br>On-Resistance                                 | V <sub>GS</sub> = 4.5 V   | r <sub>DS(on)</sub> | N-Ch      |       | 0.240 | 0.300    |       | 0.38 | 0.500 | Ω  |
|                                                               | V <sub>GS</sub> = - 4.5 V |                     | P-Ch      |       | 0.510 | 0.640    |       | 0.7  | 1.0   |    |
|                                                               | V <sub>GS</sub> = 3.0 V   |                     | N-Ch      |       | 0.325 | 0.410    |       | 0.55 | 0.750 |    |
|                                                               | V <sub>GS</sub> = - 3.0 V |                     | P-Ch      |       | 0.780 | 0.980    |       | 1.1  | 1.3   |    |
| Forward Transconductance                                      |                           | g <sub>fs</sub>     | N-Ch      |       | 1.8   |          |       | 2.7  |       | S  |
|                                                               |                           |                     | P-Ch      |       | 1.1   |          |       | 1.2  |       |    |
| Diode Forward Voltage                                         |                           | V <sub>SD</sub>     | N-Ch      |       | 0.87  | 1.2      |       |      | 1.2   | V  |
|                                                               |                           |                     | P-Ch      |       | - 1.0 | - 1.3    |       |      | - 1.2 |    |
| Dynamic                                                       |                           |                     |           |       |       |          |       |      |       |    |
| Total Gate Charge                                             |                           | Q <sub>g</sub>      | N-Ch      |       | 0.95  | 1.4      |       | 0.8  | 2.0   | nC |
|                                                               |                           |                     | P-Ch      |       | 1.10  | 1.7      |       | 1.10 | 2.5   |    |
| Gate-Source Charge                                            |                           | Q <sub>gs</sub>     | N-Ch      |       | 0.22  |          |       | 0.25 |       |    |
|                                                               |                           |                     | P-Ch      |       | 0.28  |          |       | 0.5  |       |    |
| Gate-Drain Charge                                             |                           | Q <sub>gd</sub>     | N-Ch      |       | 0.24  |          |       | 0.2  |       |    |
|                                                               |                           |                     | P-Ch      |       | 0.26  |          |       | 0.2  |       |    |
| Gate Resistance                                               |                           | R <sub>g</sub>      | N-Ch      |       | 3.5   | 5.3      | 0.3   |      | 1.5   | Ω  |
|                                                               |                           |                     | P-Ch      |       | 10.5  | 16       | 3     |      | 16    |    |
| Switching <sup>a</sup>                                        |                           |                     |           |       |       |          |       |      |       |    |
| Turn-On Time                                                  |                           | t <sub>d(on)</sub>  | N-Ch      |       | 8     | 14       |       | 10   | 20    | ns |
|                                                               |                           |                     | P-Ch      |       | 13    | 20       |       | 8    | 15    |    |
|                                                               |                           | t <sub>r</sub>      | N-Ch      |       | 16    | 25       |       | 20   | 40    |    |
|                                                               |                           |                     | P-Ch      |       | 34    | 50       |       | 20   | 40    |    |
| Turn-Off Time                                                 |                           | t <sub>d(off)</sub> | N-Ch      |       | 20    | 30       |       | 20   | 40    |    |
|                                                               |                           |                     | P-Ch      |       | 18    | 30       |       | 10   | 20    |    |
|                                                               |                           | t <sub>f</sub>      | N-Ch      |       | 9     | 15       |       | 16   | 30    |    |
|                                                               |                           |                     | P-Ch      |       | 18    | 30       |       | 8    | 15    |    |
| Source-Drain Reverse Recovery Time                            |                           | t <sub>rr</sub>     | N-Ch      |       | 20    | 30       |       | 40   | 80    |    |
|                                                               |                           |                     | N-Ch      |       | 25    | 40       |       | 40   | 80    |    |

Specification comparisons are supplied as a courtesy to compare two devices and do not constitute a commercial product datasheet or any guarantee of identical performance. Designers should refer to the appropriate datasheets of the same number for guaranteed specification limits.