

Efficiency and Derating

**SUNNY BOY / SUNNY BOY STORAGE /
SUNNY TRIPOWER / SUNNY MINI CENTRAL /
SUNNY HIGHPOWER**

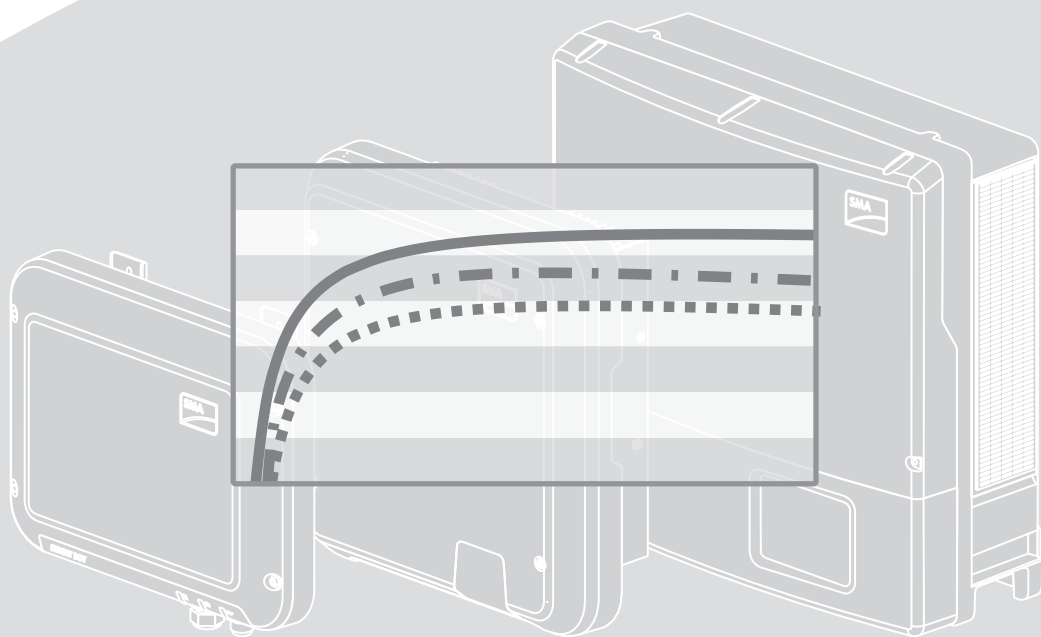


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1 Information on this Document

1.1 Validity

This document describes in graphic and tabular form the efficiency profile and the derating behavior in accordance with DIN EN 50524:2010 of the following SMA inverters (status: 04/2017, subject to technical changes):

Sunny Boy

- SB 240-10
- SB 1200 / SB 1700
- SB 1300TL-10 / SB 1600TL-10 / SB 2100TL
- SB1.5-1VL-40 / SB2.5-1VL-40
- SB 2500 / SB 3000
- SB 2000HF-30 / SB 2500HF-30 / SB 3000HF-30
- SB3.0-1AV-40 / SB3.6-1AV-40 / SB4.0-1AV-40 / SB5.0-1AV-40
- SB 3300 / SB 3800
- SB 3300-11 / SB 3800-11
- SB 3000TL-20 / SB 4000TL-20 / SB 5000TL-20
- SB 3000TL-21 / SB 3600TL-21 / SB 4000TL-21 / SB 5000TL-21
- SB 3600SE-10 / SB 5000SE-10

Sunny Boy Storage

- SBS2.5-1VL-10
- SBS3.7-10
- SBS5.0-10
- SBS6.0-10

Sunny Tripower

- STP 50-40 / STP 50-JP-40
- STP 60-10 / STP 60-JP-10
- STP 5000TL-20 / STP 6000TL-20 / STP 7000TL-20 / STP 8000TL-20 / STP 9000TL-20 / STP 10000TL-20 / STP 12000TL-20
- STP 8000TL-10 / STP 10000TL-10 / STP 12000TL-10 / STP 15000TL-10 / STP 17000TL-10
- STP 10000TLEE-JP-10 / STP 10000TLEE-JP-11 / STP 20000TLEE-JP-11
- STP 15000TLEE-10/STP 20000TLEE-10
- STP 15000TLHE-10 / STP 20000TLHE-10
- STP 15000TL-30 / STP 20000TL-30 / STP 25000TL-30
- STP 24500TL-JP-30 / STP 25000TL-JP-30

Sunny Mini Central

- SMC 4600A / SMC 5000A / SMC 6000A

- SMC 4600A-11 / SMC 5000A-11 / SMC 6000A-11
- SMC 6000TL / SMC 8000TL / SMC 7000TL
- SMC 7000HV-11
- SMC 9000TL-10 / SMC 10000TL-10 / SMC 11000TL-10
- SMC 9000TLRP-10 / SMC 10000TLRP-10 / SMC 11000TLRP-10

Sunny Highpower PEAK1

- SHP 75-10 / SHP 75-JP-10

1.2 Target Group

The information in this document is intended for installers and operators of PV systems with SMA inverters as well as for PV system planners.

2 Data Explanation

Efficiency Profile - Curve and Measured Values

The efficiency is the ratio of output power to input power and is given as a percentage value. This document describes the inverter efficiency in graphic and tabular form. The efficiency is given for the minimum MPP voltage, the rated input voltage and the maximum MPP voltage.

Maximum and European Weighted Efficiency

The maximum efficiency is the highest inverter efficiency at rated input voltage. The European weighted efficiency is calculated by weighing different partial load efficiencies and the full load efficiency at the rated input voltage according to the frequency in which they occur.

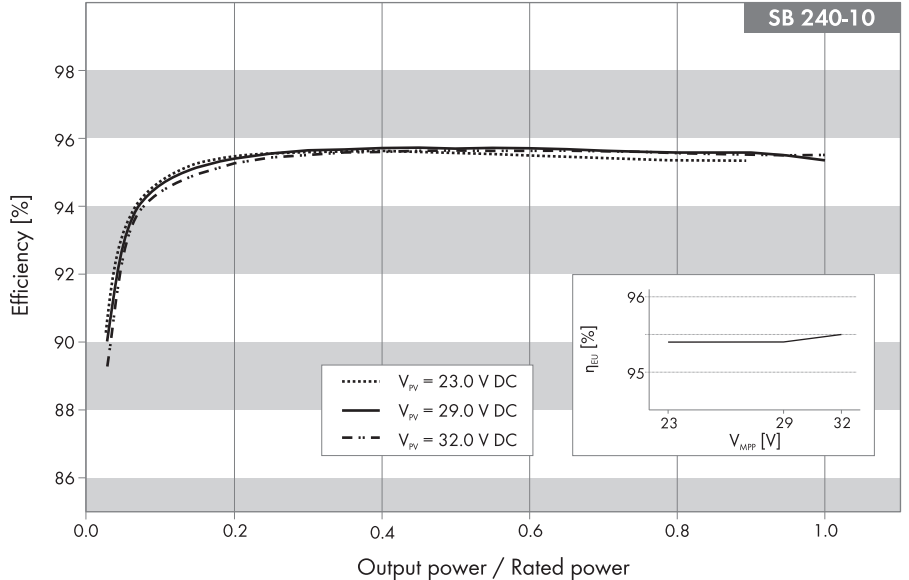
The calculation formula is: $\eta_{EU} = (0.03 \times \eta_{5\%}) + (0.06 \times \eta_{10\%}) + (0.13 \times \eta_{20\%}) + (0.1 \times \eta_{30\%}) + (0.48 \times \eta_{50\%}) + (0.2 \times \eta_{100\%})$

Derating Behavior

Safety mechanisms are implemented in the inverter protecting the inverter against damage due to too high ambient temperatures or too high output currents. This behavior reduces the inverter output power ("derating"). In this document, the derating behavior of the inverters is shown in graphic form. The derating behavior is given for the minimum MPP voltage, the rated input voltage and the maximum MPP voltage.

3 Sunny Boy

3.1 SB 240-10



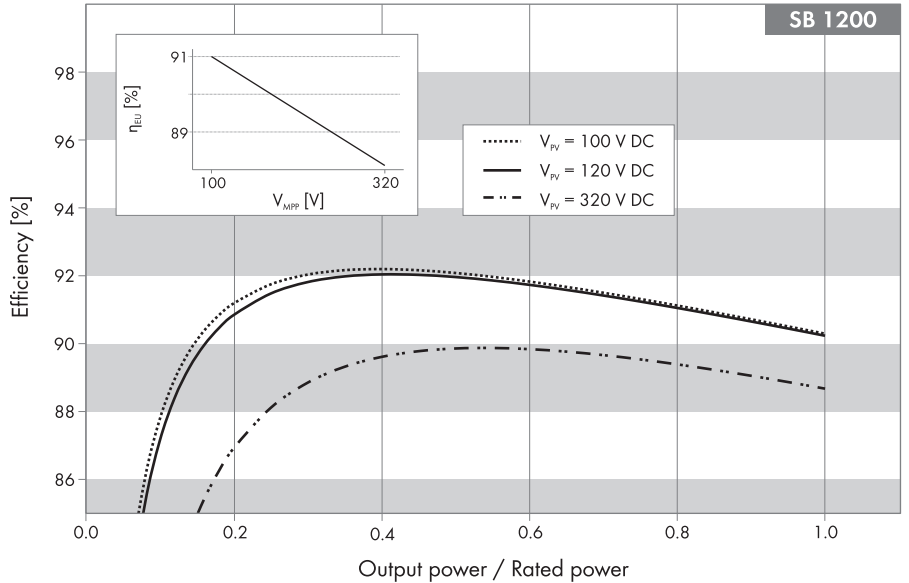
| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 95.8% |
| European efficiency, η_{EU} | 95.3% |

Efficiency Profile

| Standardized output power | Efficiency | | |
|---------------------------|-----------------------------|-----------------------------|-----------------------------|
| | Minimum MPP voltage 23 V | Rated input voltage 29 V | Maximum MPP voltage 32 V |
| 5% | 93.0% | 92.6% | 93.0% |
| 10% | 94.7% | 94.6% | 94.5% |
| 20% | 95.4% | 95.4% | 95.3% |
| 25% | 95.5% | 95.6% | 95.4% |
| 30% | 95.6% | 95.7% | 95.5% |
| 50% | 95.6% | 95.8% | 95.6% |
| 75% | 95.4% | 95.6% | 95.6% |
| 100% | 95.4% | 95.4% | 95.5% |

3.2 SB 1200

3.2.1 Efficiency

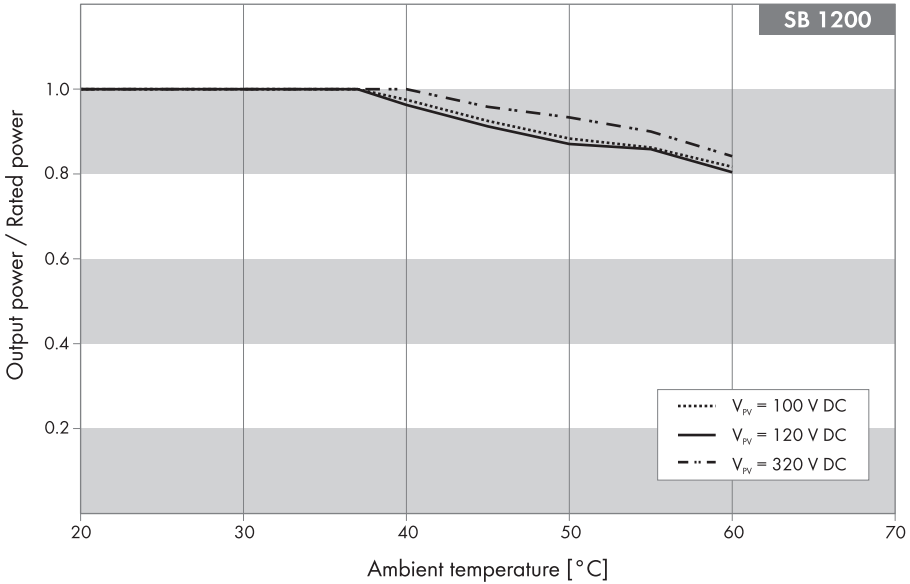


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 92.1% |
| European efficiency, η_{EU} | 90.9% |

Efficiency Profile

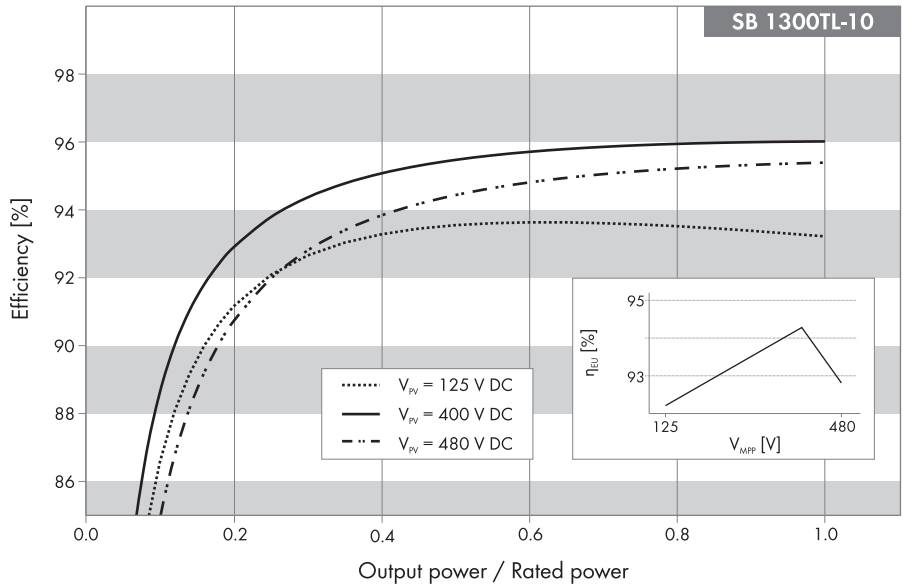
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 100 V | Rated input voltage 120 V | Maximum MPP voltage 320 V |
| 5% | 80.7% | 79.7% | 72.7% |
| 10% | 87.8% | 87.1% | 81.3% |
| 20% | 91.2% | 90.8% | 86.9% |
| 25% | 91.7% | 91.5% | 88.1% |
| 30% | 92.0% | 91.8% | 88.8% |
| 50% | 92.1% | 92.0% | 89.9% |
| 75% | 91.3% | 91.2% | 89.5% |
| 100% | 90.3% | 90.2% | 88.7% |

3.2.2 Derating Behavior



3.3 SB 1300TL-10

3.3.1 Efficiency

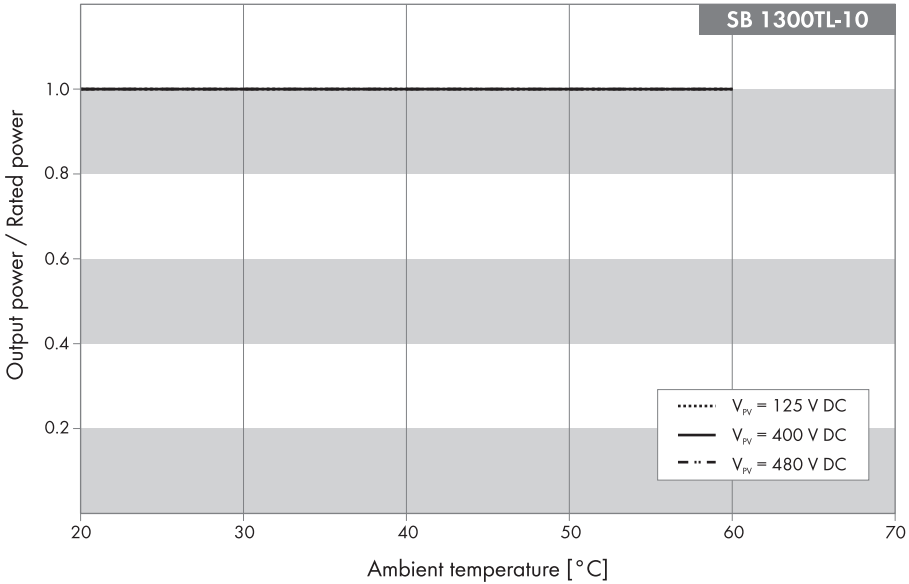


| | |
|---|-------|
| Maximum efficiency, η_{\max} | 96.0% |
| European efficiency, η_{EU} | 94.3% |

Efficiency Profile

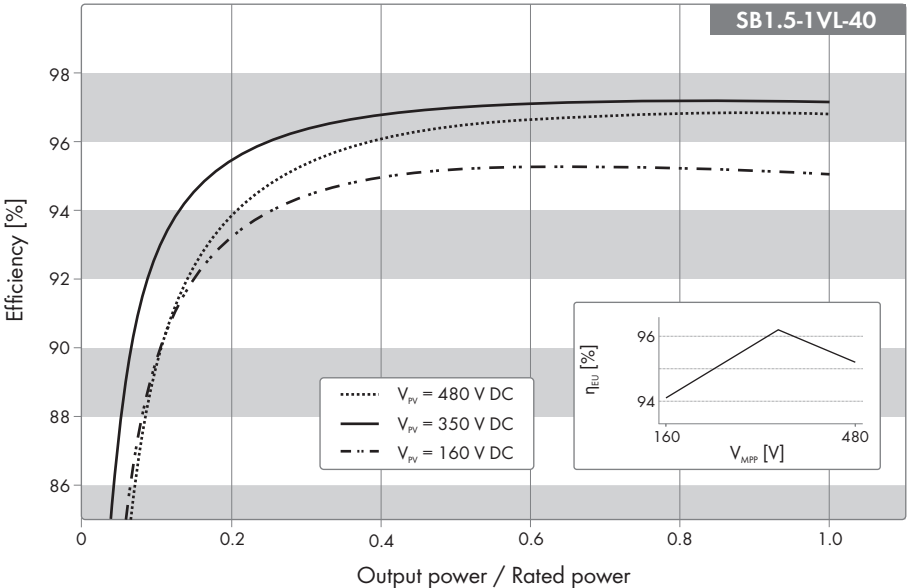
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 125 V | Rated input voltage 400 V | Maximum MPP voltage 480 V |
| 5% | 78.3% | 80.6% | 74.6% |
| 10% | 86.6% | 88.6% | 84.9% |
| 20% | 91.2% | 92.9% | 90.7% |
| 25% | 92.7% | 93.8% | 92.0% |
| 30% | 93.6% | 94.4% | 92.8% |
| 50% | 93.6% | 95.5% | 94.4% |
| 75% | 93.6% | 95.9% | 95.1% |
| 100% | 93.2% | 96.0% | 95.4% |

3.3.2 Derating Behavior



3.4 SB1.5-1VL-40

3.4.1 Efficiency



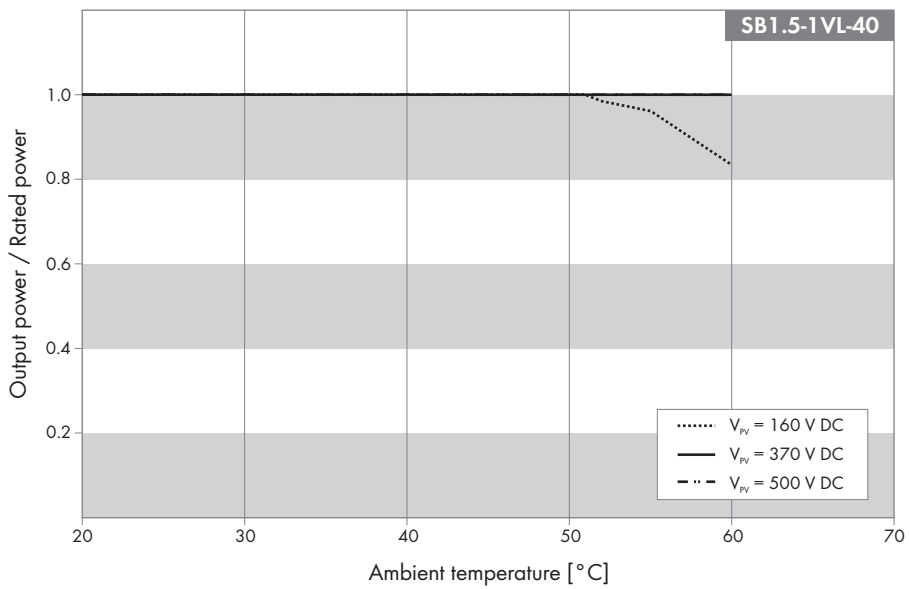
Maximum efficiency, η_{max} 97.2%

European weighted efficiency, η_{EU} 96.2%

Efficiency Profile

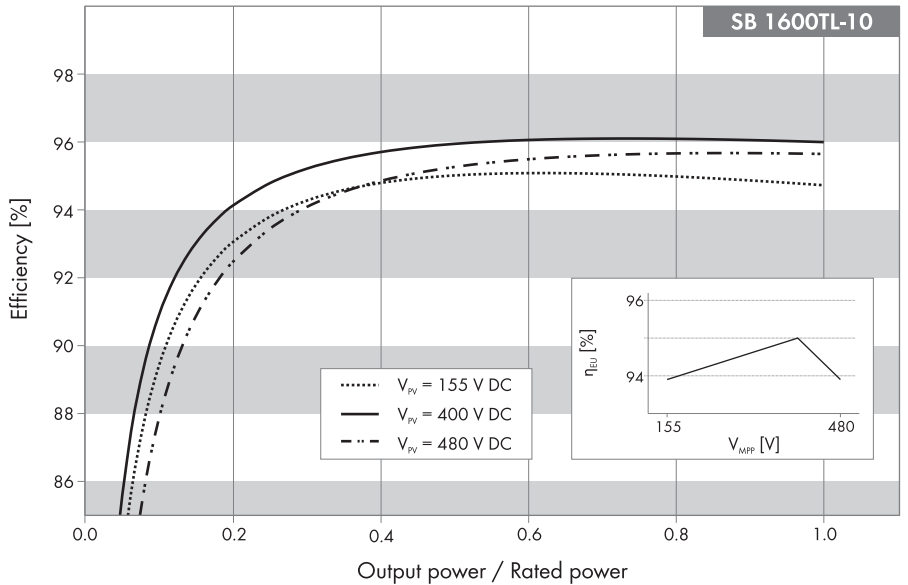
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 160 V | Rated input voltage 350 V | Maximum MPP voltage 480 V |
| 5% | 83.2% | 87.5% | 81.6% |
| 10% | 89.6% | 92.7% | 89.4% |
| 20% | 93.3% | 95.5% | 93.9% |
| 25% | 94.0% | 96.0% | 94.8% |
| 30% | 94.4% | 96.4% | 95.4% |
| 50% | 95.2% | 97.0% | 96.4% |
| 75% | 95.3% | 97.2% | 96.8% |
| 100% | 95.1% | 97.2% | 96.8% |

3.4.2 Derating Behavior



3.5 SB 1600TL-10

3.5.1 Efficiency

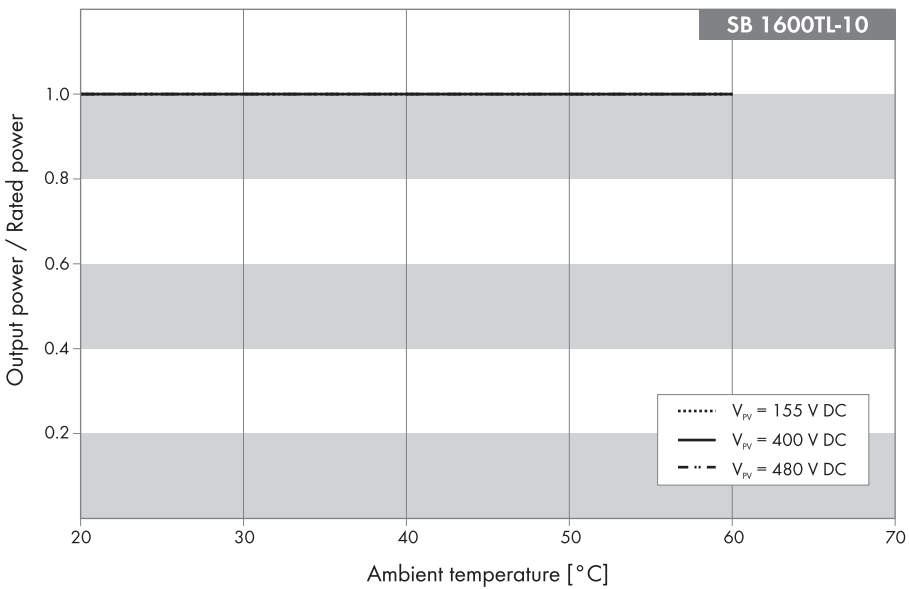


| | |
|-----------------------------------|-------|
| Maximum efficiency, η_{\max} | 96.0% |
| European efficiency, η_{EU} | 95.0% |

Efficiency Profile

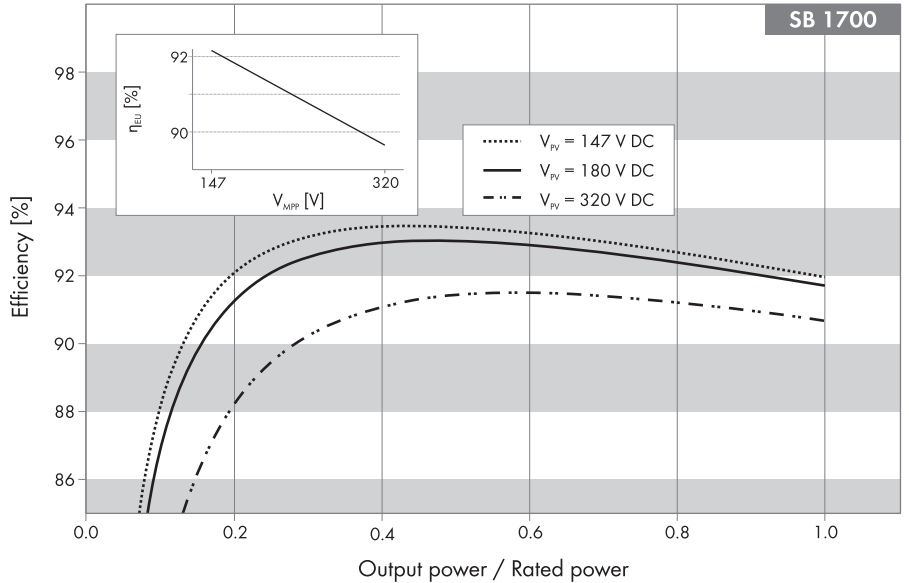
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 155 V | Rated input voltage 400 V | Maximum MPP voltage 480 V |
| 5% | 83.2% | 85.1% | 79.8% |
| 10% | 89.4% | 90.9% | 87.8% |
| 20% | 93.0% | 94.1% | 92.5% |
| 25% | 93.8% | 94.8% | 93.4% |
| 30% | 94.3% | 95.2% | 94.1% |
| 50% | 95.0% | 95.9% | 95.3% |
| 75% | 95.0% | 96.0% | 95.6% |
| 100% | 94.7% | 96.0% | 95.6% |

3.5.2 Derating Behavior



3.6 SB 1700

3.6.1 Efficiency

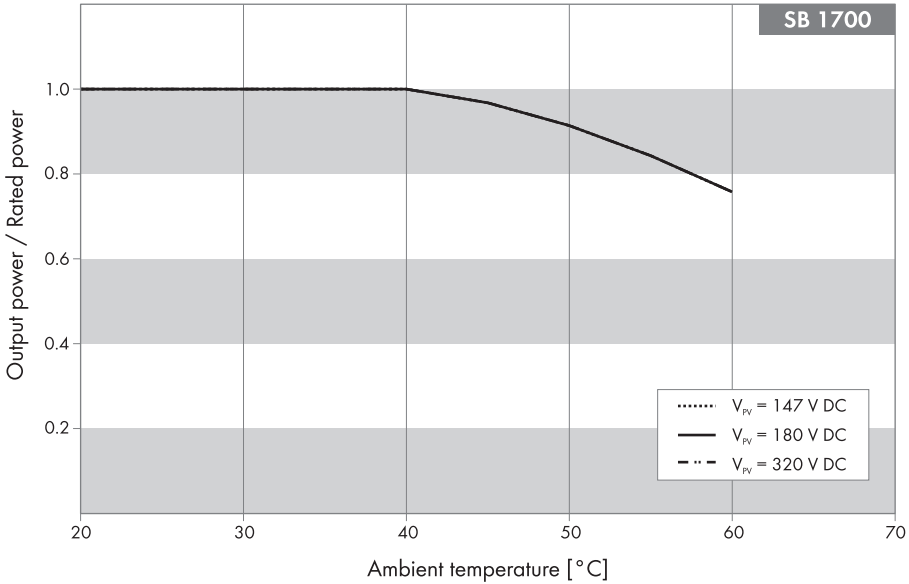


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 93.5% |
| European efficiency, η_{EU} | 91.8% |

Efficiency Profile

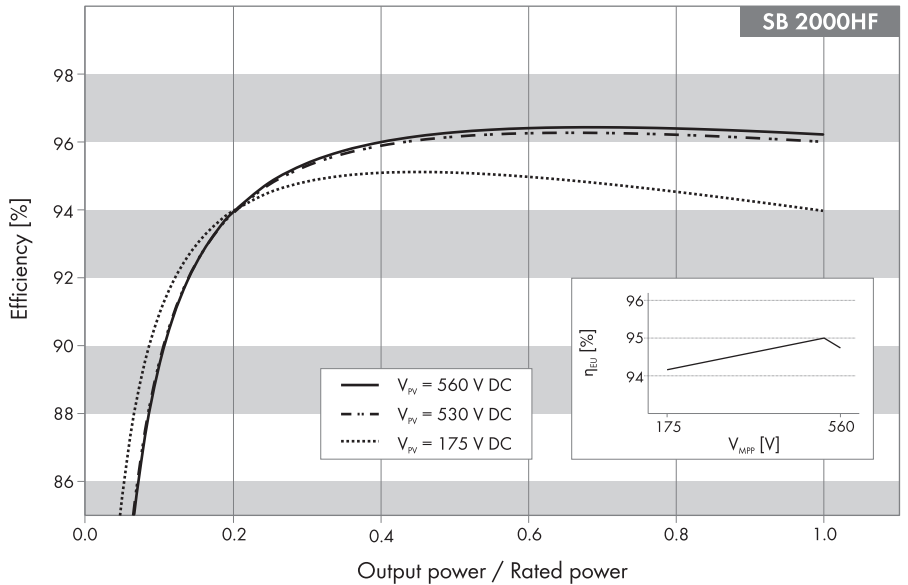
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 147 V | Rated input voltage 180 V | Maximum MPP voltage 320 V |
| 5% | 80.4% | 78.9% | 74.3% |
| 10% | 88.2% | 87.0% | 82.6% |
| 20% | 92.1% | 91.3% | 88.3% |
| 25% | 92.8% | 92.1% | 89.5% |
| 30% | 93.2% | 92.6% | 90.3% |
| 50% | 93.4% | 93.0% | 91.4% |
| 75% | 92.8% | 92.5% | 91.3% |
| 100% | 92.0% | 91.7% | 90.7% |

3.6.2 Derating Behavior



3.7 SB 2000HF-30

3.7.1 Efficiency

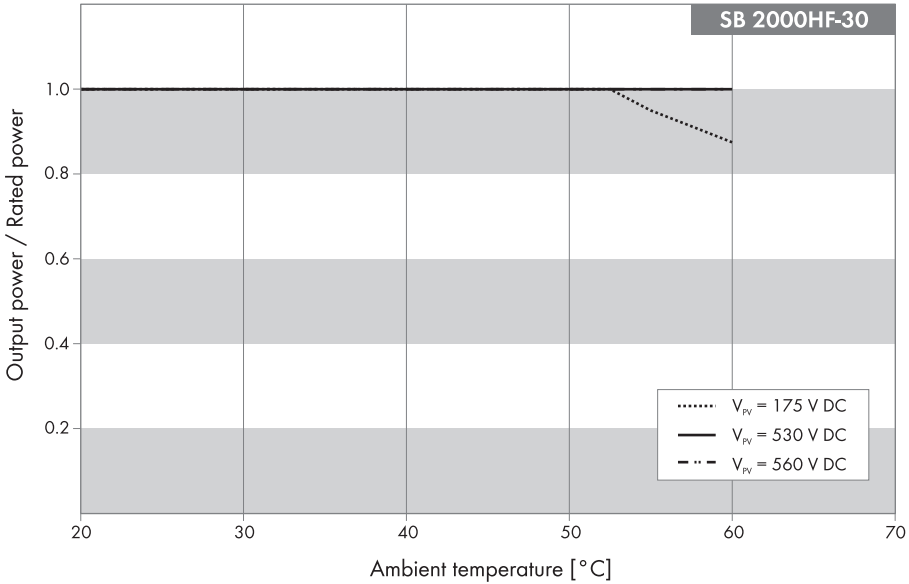


| | |
|--|--------|
| Maximum efficiency, η_{\max} | 96.3 % |
| European weighted efficiency, η_{EU} | 95.0 % |

Efficiency Profile

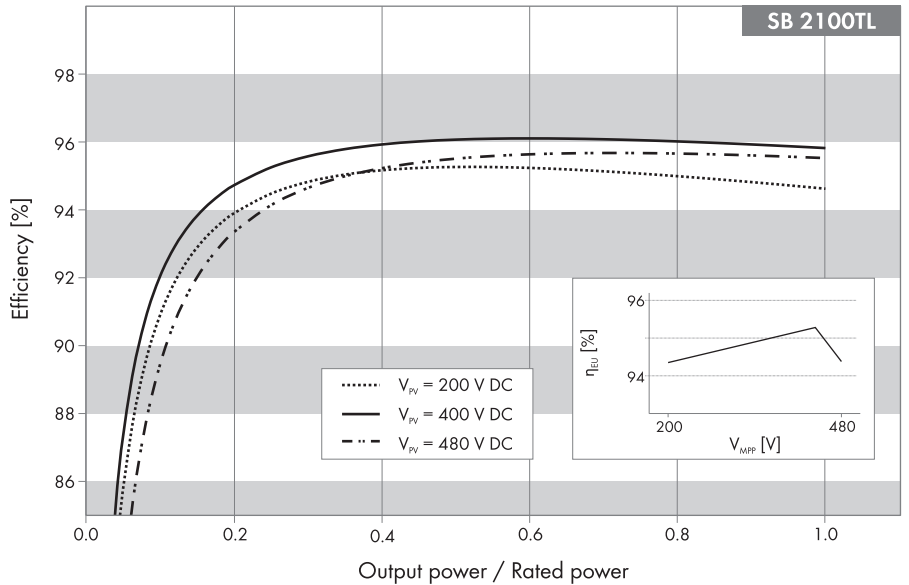
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 175 V | Rated input voltage 530 V | Maximum MPP voltage 560 V |
| 5 % | 85.1 % | 80.8 % | 80.5 % |
| 10 % | 90.8 % | 89.6 % | 89.0 % |
| 20 % | 93.7 % | 93.9 % | 93.6 % |
| 25 % | 94.6 % | 95.0 % | 94.8 % |
| 30 % | 94.8 % | 95.3 % | 95.1 % |
| 50 % | 95.2 % | 96.2 % | 96.1 % |
| 75 % | 94.5 % | 96.3 % | 96.3 % |
| 100 % | 94.0 % | 96.2 % | 96.0 % |

3.7.2 Derating Behavior



3.8 SB 2100TL

3.8.1 Efficiency

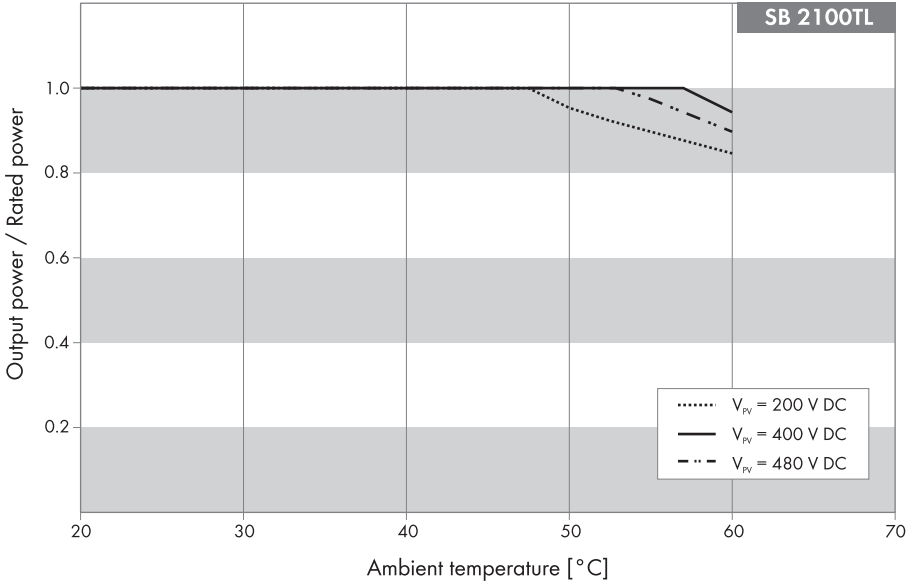


| | |
|---|-------|
| Maximum efficiency, η_{\max} | 96.0% |
| European efficiency, η_{EU} | 95.2% |

Efficiency Profile

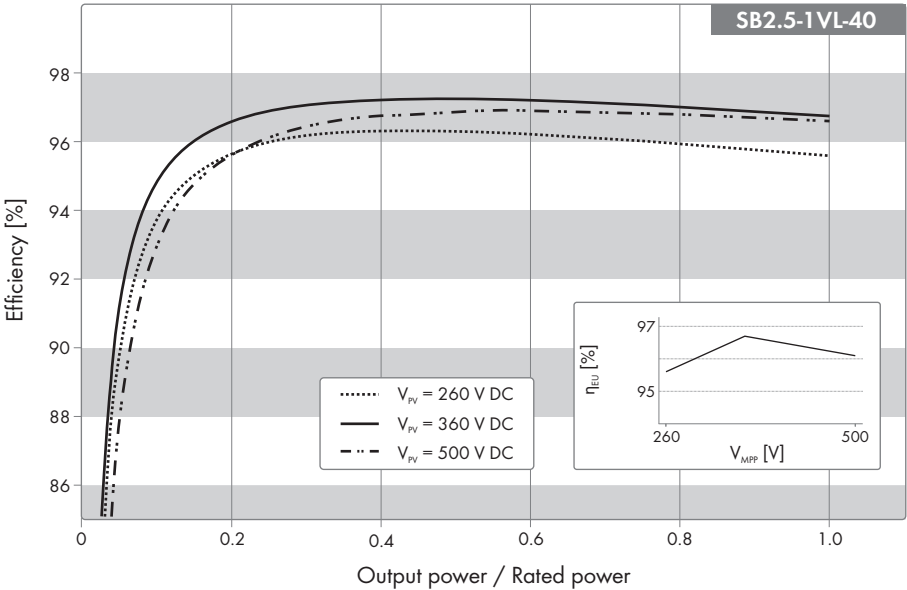
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 200 V | Rated input voltage 400 V | Maximum MPP voltage 480 V |
| 5% | 85.4% | 87.0% | 82.4% |
| 10% | 90.9% | 92.0% | 89.4% |
| 20% | 93.9% | 94.7% | 93.3% |
| 25% | 94.5% | 95.2% | 94.1% |
| 30% | 94.8% | 95.6% | 94.6% |
| 50% | 95.3% | 96.0% | 95.5% |
| 75% | 95.1% | 96.0% | 95.7% |
| 100% | 94.6% | 95.8% | 95.5% |

3.8.2 Derating Behavior



3.9 SB2.5-1VL-40

3.9.1 Efficiency



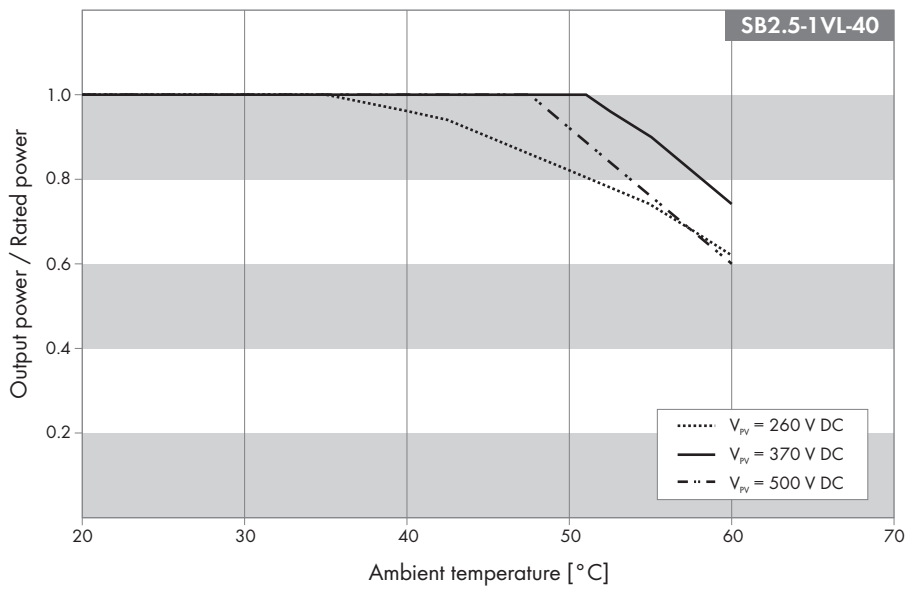
Maximum efficiency, η_{max} 97.2%

European weighted efficiency, η_{EU} 96.7%

Efficiency Profile

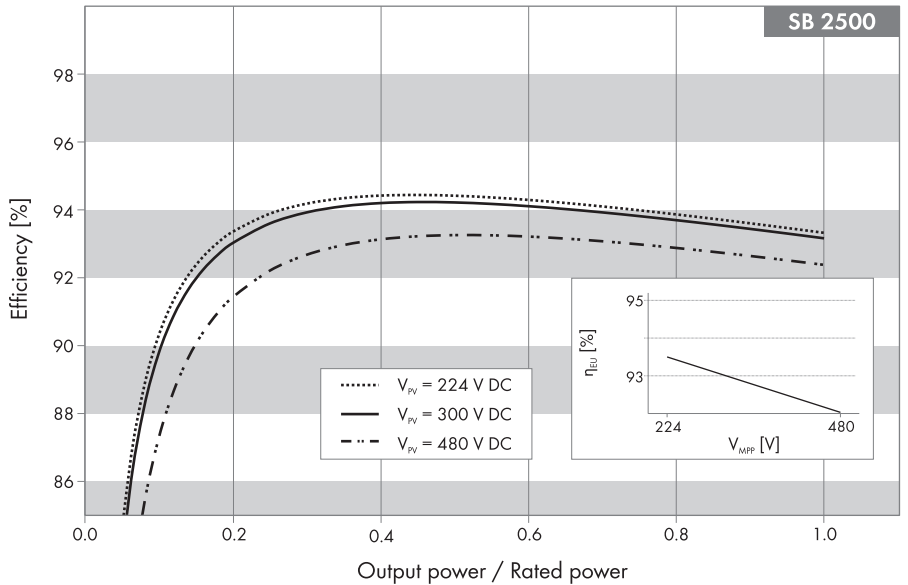
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 260 V | Rated input voltage 360 V | Maximum MPP voltage 500 V |
| 5% | 89.8% | 91.2% | 87.8% |
| 10% | 93.7% | 94.8% | 92.9% |
| 20% | 95.6% | 96.6% | 95.6% |
| 25% | 96.0% | 96.9% | 96.1% |
| 30% | 96.1% | 97.0% | 96.4% |
| 50% | 96.3% | 97.2% | 96.9% |
| 75% | 96.0% | 97.0% | 96.8% |
| 100% | 95.6% | 96.7% | 96.6% |

3.9.2 Derating Behavior



3.10 SB 2500

3.10.1 Efficiency

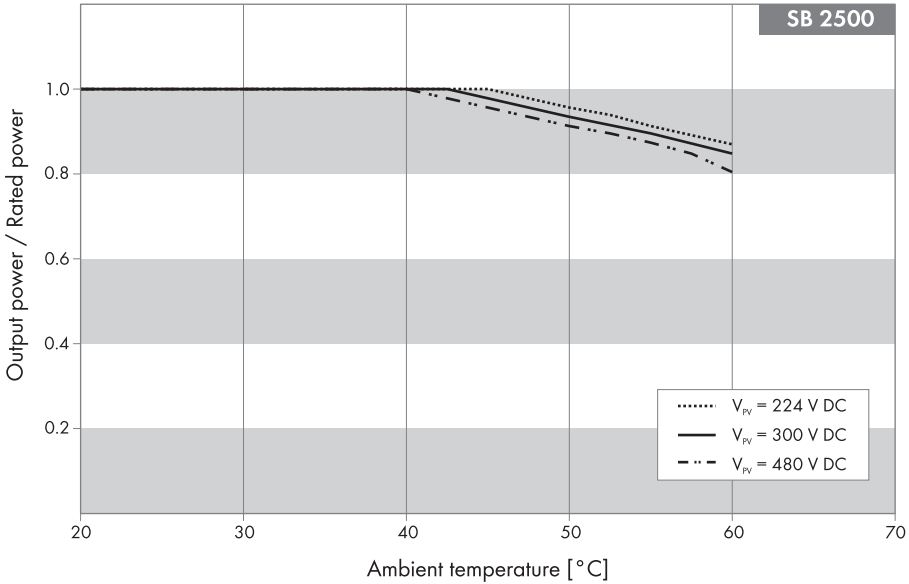


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 94.1% |
| European efficiency, η_{EU} | 93.2% |

Efficiency Profile

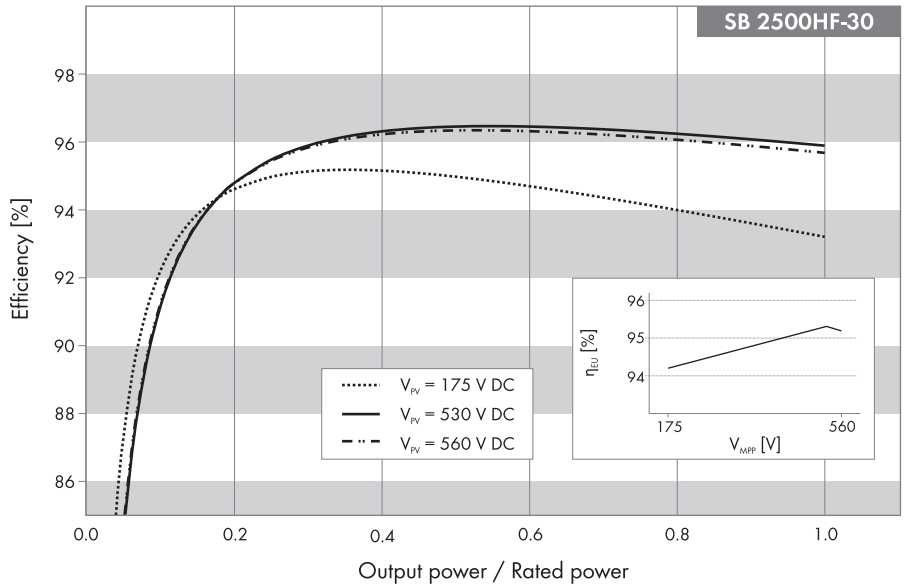
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 224 V | Rated input voltage 300 V | Maximum MPP voltage 480 V |
| 5% | 84.0% | 83.2% | 79.5% |
| 10% | 90.3% | 89.8% | 87.3% |
| 20% | 93.4% | 93.0% | 91.4% |
| 25% | 93.9% | 93.6% | 92.2% |
| 30% | 94.1% | 93.9% | 92.7% |
| 50% | 94.1% | 94.1% | 93.3% |
| 75% | 94.0% | 93.8% | 93.0% |
| 100% | 93.3% | 93.2% | 92.4% |

3.10.2 Derating Behavior



3.11 SB 2500HF-30

3.11.1 Efficiency

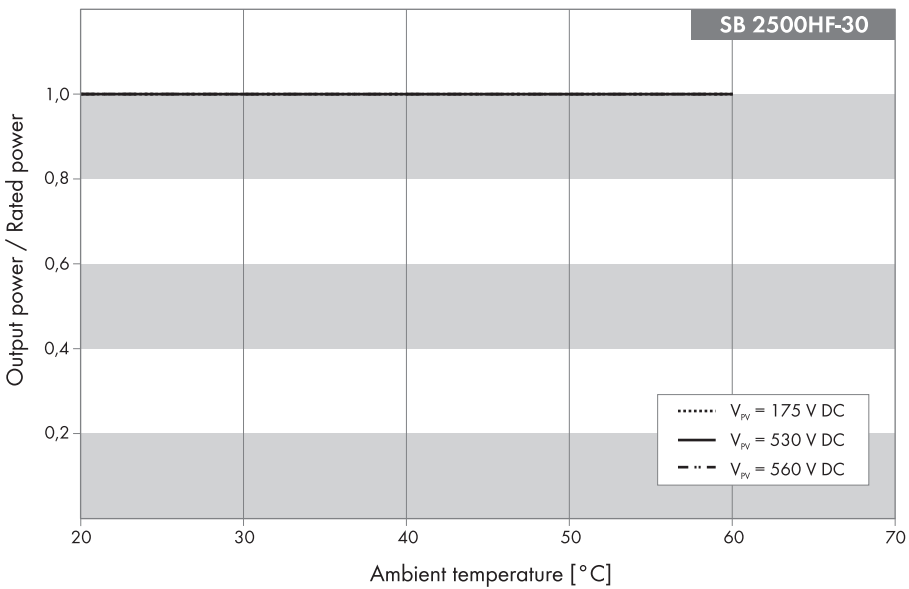


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 96.3% |
| European efficiency, η_{EU} | 95.3% |

Efficiency Profile

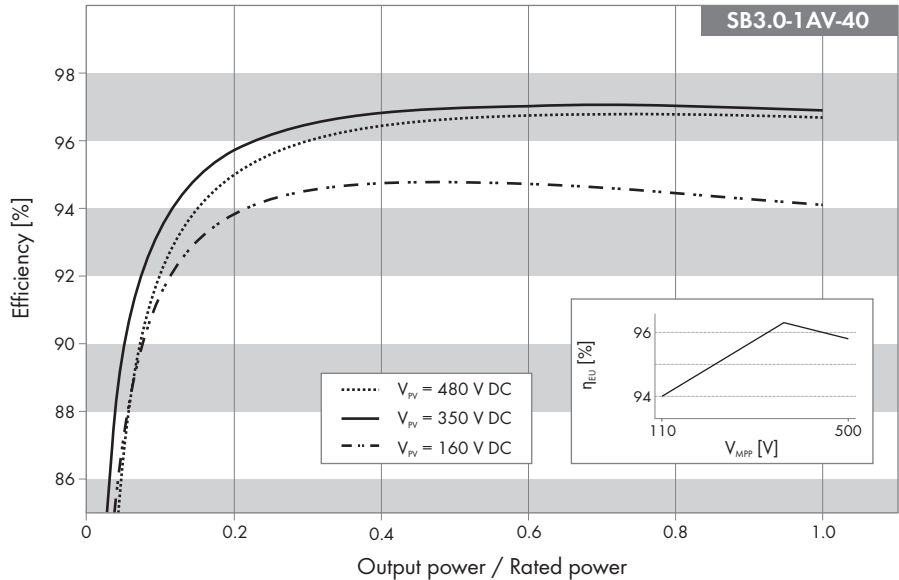
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 175 V | Rated input voltage 530 V | Maximum MPP voltage 560 V |
| 5% | 87.0% | 84.4% | 84.1% |
| 10% | 92.1% | 91.2% | 91.0% |
| 20% | 94.4% | 94.8% | 94.5% |
| 25% | 95.0% | 95.6% | 95.5% |
| 30% | 95.1% | 95.8% | 95.7% |
| 50% | 95.1% | 96.3% | 96.3% |
| 75% | 93.8% | 96.2% | 96.2% |
| 100% | 93.3% | 95.8% | 95.7% |

3.11.2 Derating Behavior



3.12 SB3.0-1AV-40

3.12.1 Efficiency



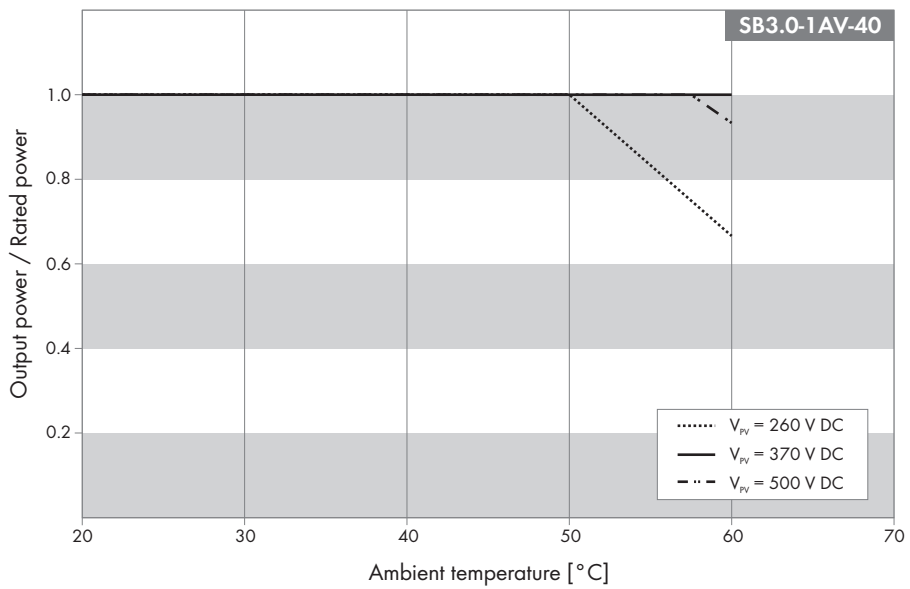
Maximum efficiency, η_{max} 97.0%

European weighted efficiency, η_{EU} 96.3%

Efficiency Profile

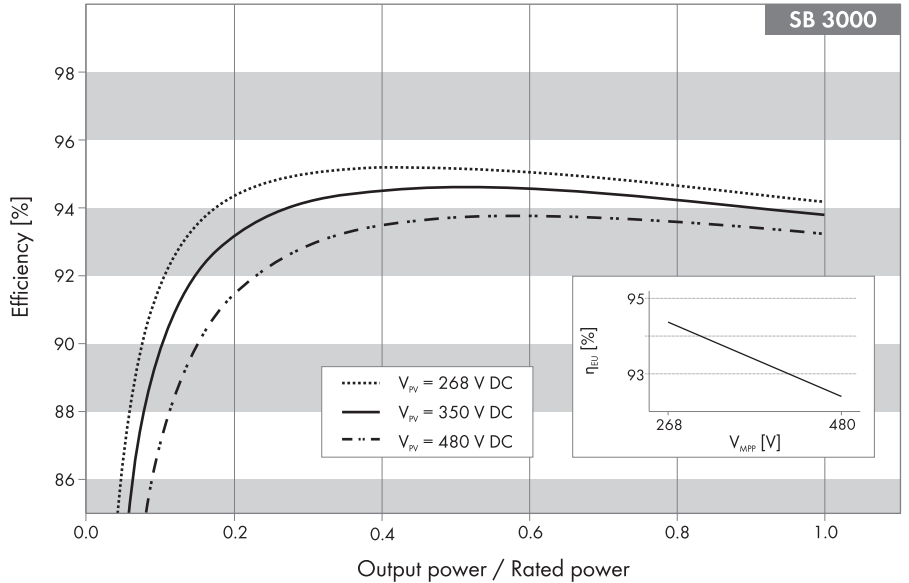
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 110 V | Rated input voltage 365 V | Maximum MPP voltage 500 V |
| 5% | 86.9% | 89.4% | 86.1% |
| 10% | 91.4% | 93.3% | 91.9% |
| 20% | 93.8% | 95.7% | 95.0% |
| 25% | 94.2% | 96.2% | 95.6% |
| 30% | 94.5% | 96.5% | 96.0% |
| 50% | 94.8% | 97.0% | 96.6% |
| 75% | 94.5% | 97.0% | 96.8% |
| 100% | 94.1% | 96.9% | 96.7% |

3.12.2 Derating Behavior



3.13 SB 3000

3.13.1 Efficiency

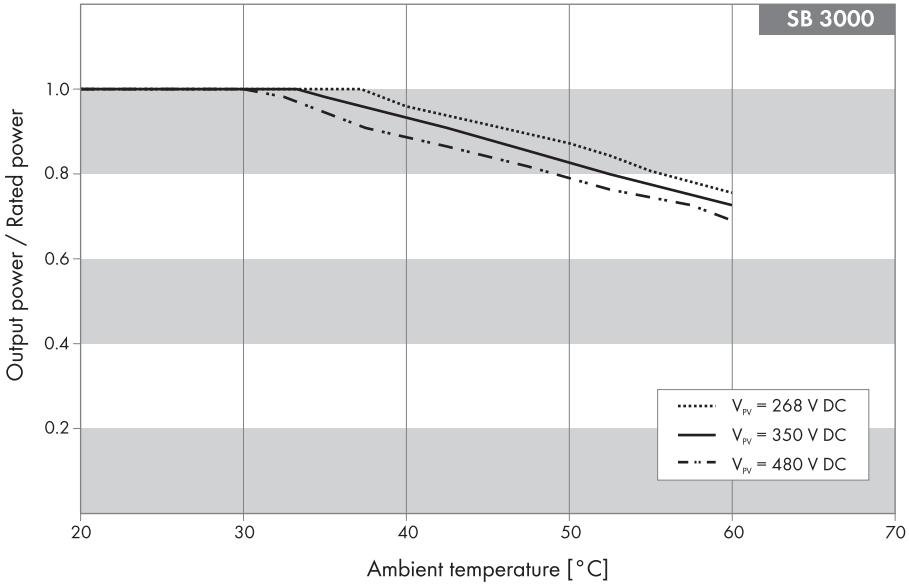


| | |
|-----------------------------------|-------|
| Maximum efficiency, η_{\max} | 95.0% |
| European efficiency, η_{EU} | 93.6% |

Efficiency Profile

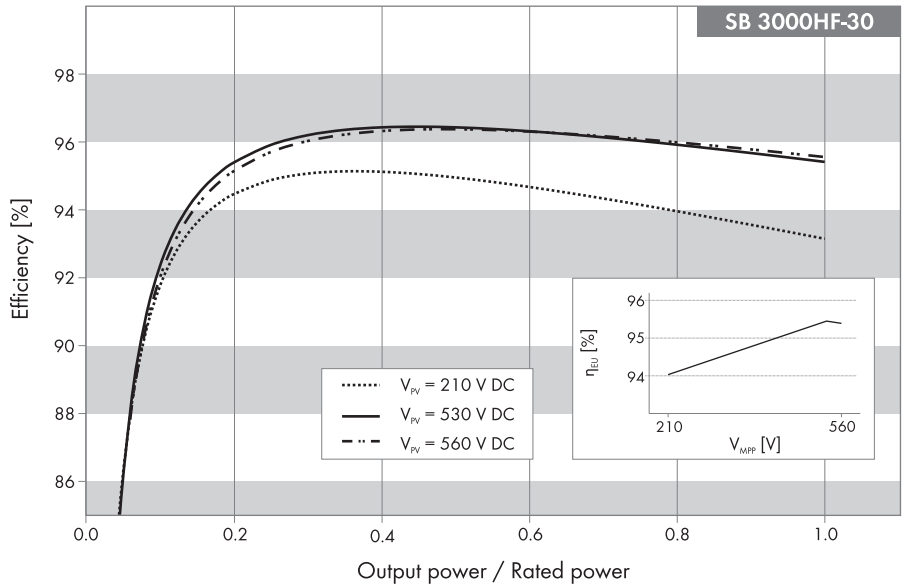
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 268 V | Rated input voltage 350 V | Maximum MPP voltage 480 V |
| 5% | 86.1% | 83.0% | 78.9% |
| 10% | 91.7% | 89.8% | 87.0% |
| 20% | 94.3% | 93.2% | 91.4% |
| 25% | 94.8% | 93.8% | 92.3% |
| 30% | 95.0% | 94.2% | 92.9% |
| 50% | 95.0% | 94.6% | 93.7% |
| 75% | 94.8% | 94.3% | 93.7% |
| 100% | 94.2% | 93.8% | 93.3% |

3.13.2 Derating Behavior



3.14 SB 3000HF-30

3.14.1 Efficiency

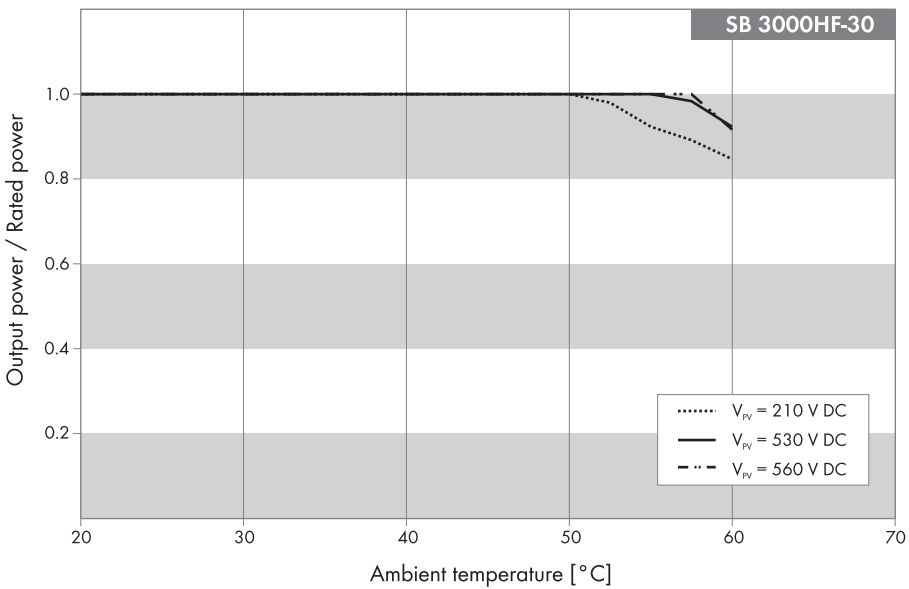


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 96.3% |
| European efficiency, η_{EU} | 95.4% |

Efficiency Profile

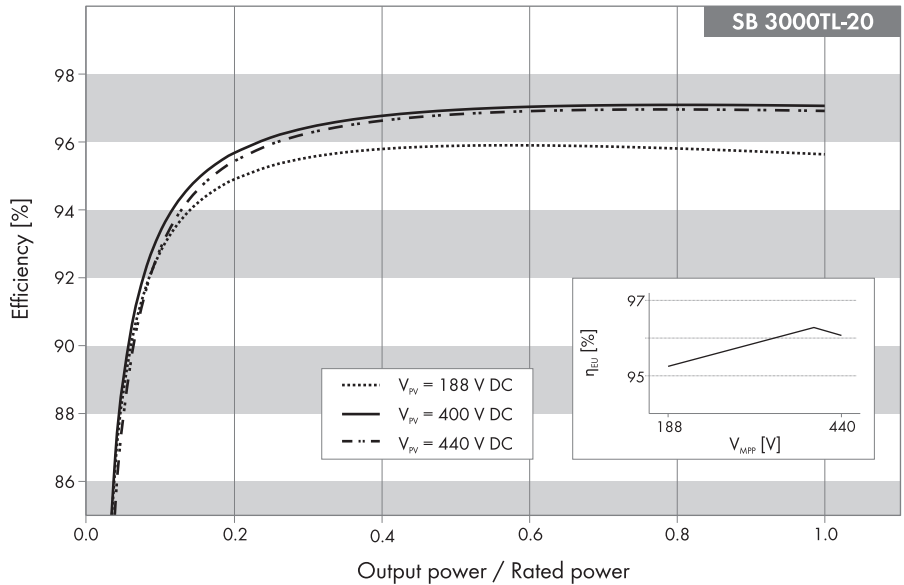
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 210 V | Rated input voltage 530 V | Maximum MPP voltage 560 V |
| 5% | 86.0% | 85.9% | 85.8% |
| 10% | 91.8% | 92.3% | 91.9% |
| 20% | 94.2% | 95.3% | 95.1% |
| 25% | 94.9% | 96.0% | 95.8% |
| 30% | 95.0% | 96.1% | 95.9% |
| 50% | 95.1% | 96.3% | 96.3% |
| 75% | 94.0% | 96.0% | 96.0% |
| 100% | 93.2% | 95.4% | 95.5% |

3.14.2 Derating Behavior



3.15 SB 3000TL-20

3.15.1 Efficiency

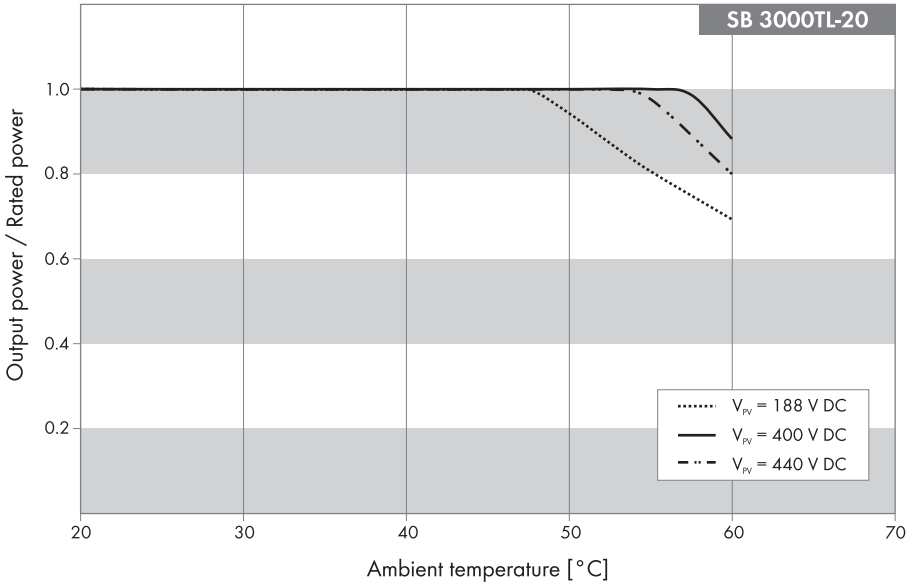


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 97.0% |
| European efficiency, η_{EU} | 96.3% |

Efficiency Profile

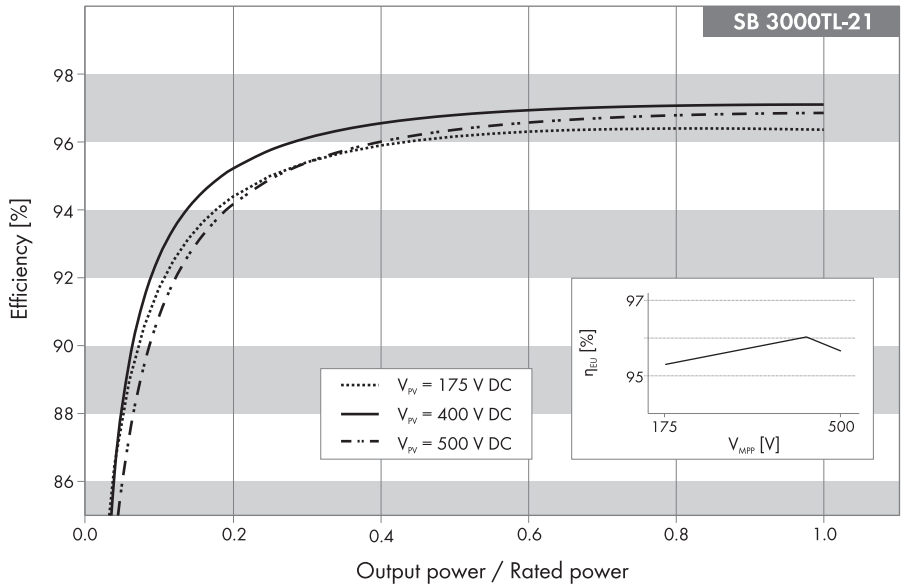
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 188 V | Rated input voltage 400 V | Maximum MPP voltage 440 V |
| 5% | 88.2% | 88.5% | 87.4% |
| 10% | 92.7% | 93.3% | 92.8% |
| 20% | 94.4% | 95.7% | 95.4% |
| 25% | 95.3% | 96.1% | 95.9% |
| 30% | 95.5% | 96.4% | 96.2% |
| 50% | 95.9% | 96.9% | 96.8% |
| 75% | 95.8% | 97.0% | 97.0% |
| 100% | 95.6% | 97.0% | 96.9% |

3.15.2 Derating Behavior



3.16 SB 3000TL-21

3.16.1 Efficiency

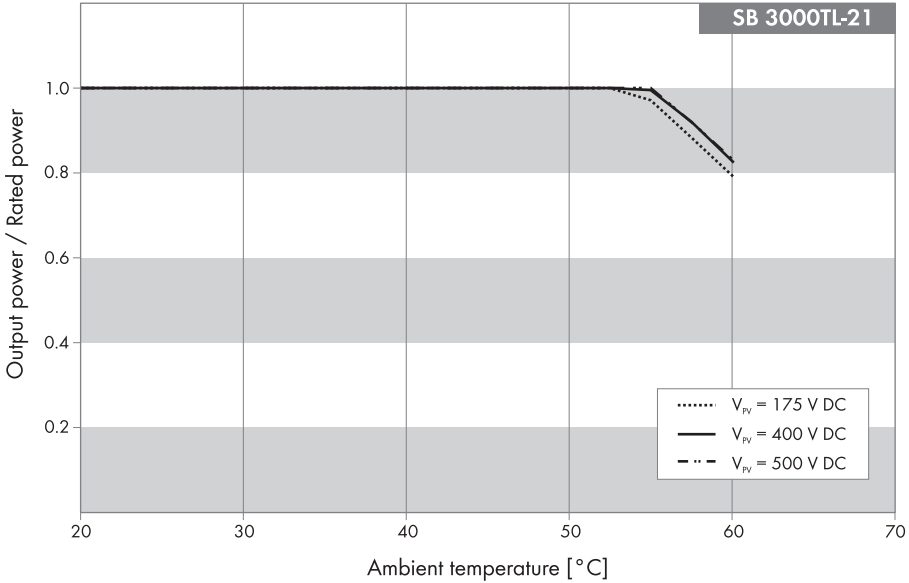


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 97.1% |
| European efficiency, η_{EU} | 96.0% |

Efficiency Profile

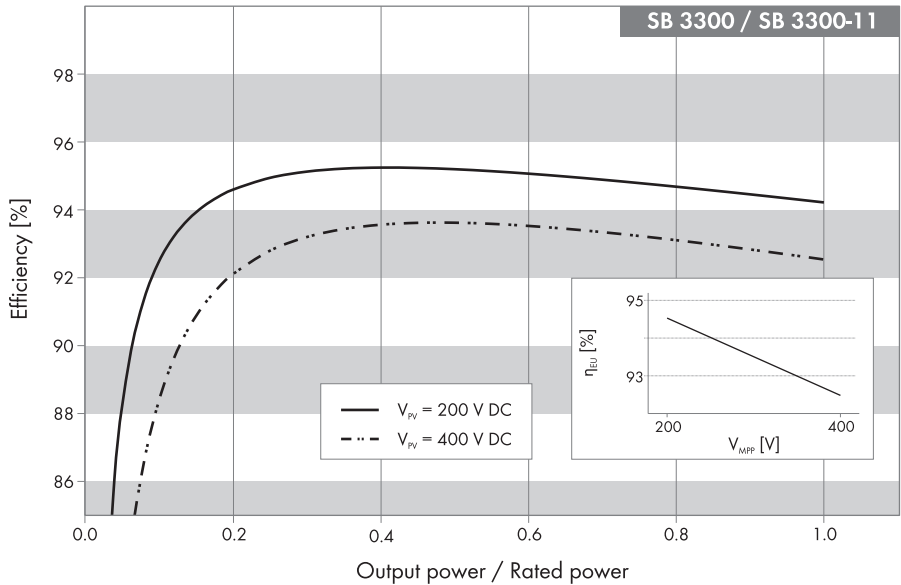
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 175 V | Rated input voltage 400 V | Maximum MPP voltage 500 V |
| 5% | 87.7% | 87.8% | 85.6% |
| 10% | 91.7% | 92.6% | 90.8% |
| 20% | 94.4% | 95.2% | 94.1% |
| 25% | 95.0% | 95.7% | 94.9% |
| 30% | 95.4% | 96.1% | 95.4% |
| 50% | 96.1% | 96.8% | 96.3% |
| 75% | 96.4% | 97.0% | 96.7% |
| 100% | 96.3% | 97.1% | 96.8% |

3.16.2 Derating Behavior



3.17 SB 3300 / SB 3300-11

3.17.1 Efficiency



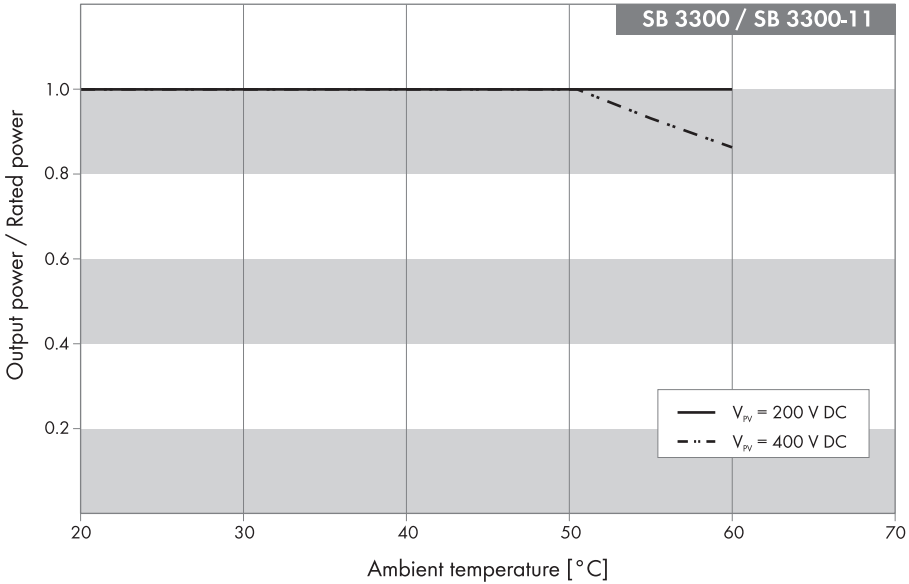
Maximum efficiency, η_{max} 95.2%

European efficiency, η_{EU} 94.4%

Efficiency Profile

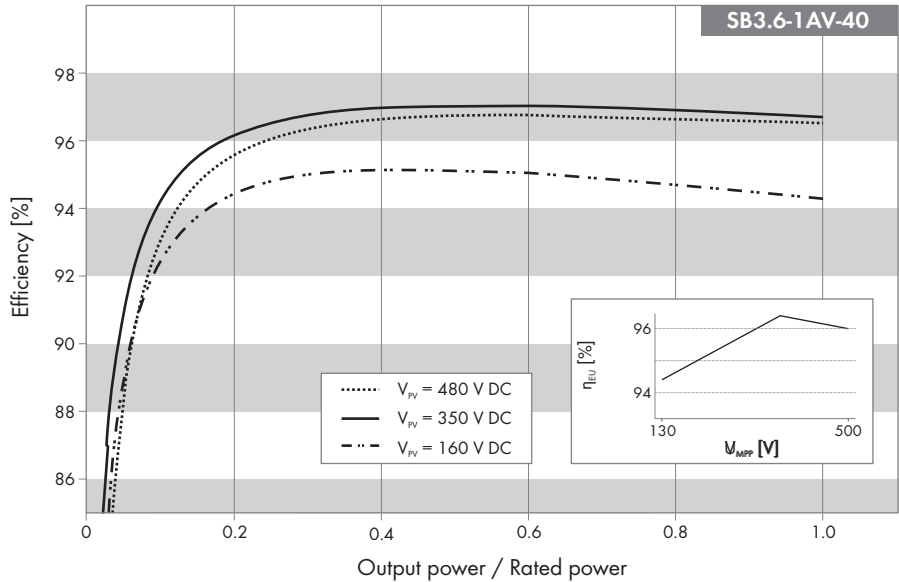
| Standardized output power | Efficiency | |
|---------------------------|---|------------------------------|
| | Minimum MPP voltage / rated input voltage 200 V | Maximum MPP voltage 400 V |
| 5% | 87.8% | 81.4% |
| 10% | 92.5% | 88.4% |
| 20% | 94.6% | 92.1% |
| 25% | 94.9% | 92.8% |
| 30% | 95.1% | 93.2% |
| 50% | 95.2% | 93.6% |
| 75% | 94.8% | 93.2% |
| 100% | 94.2% | 92.5% |

3.17.2 Derating Behavior



3.18 SB3.6-1AV-40

3.18.1 Efficiency

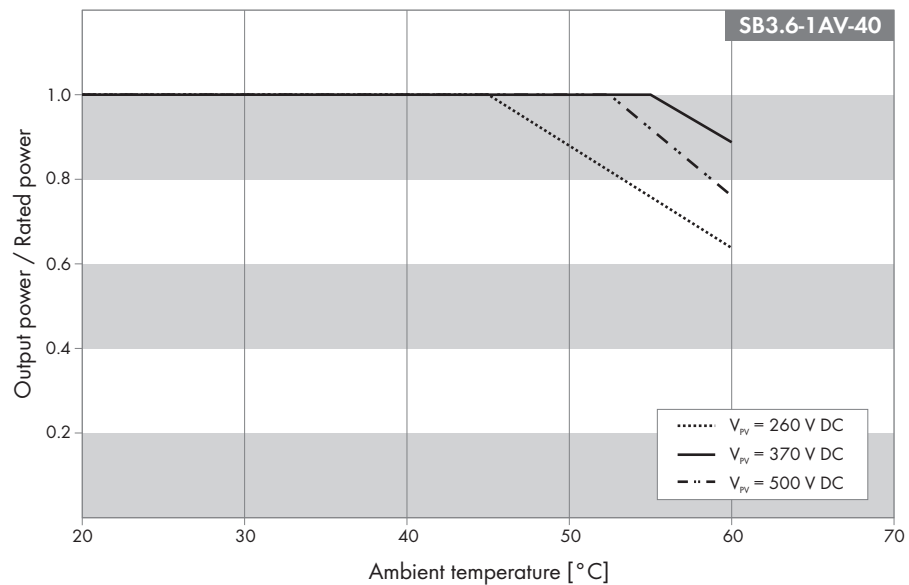


| | |
|--|-------|
| Maximum efficiency, η_{\max} | 97.0% |
| European weighted efficiency, η_{EU} | 96.4% |

Efficiency Profile

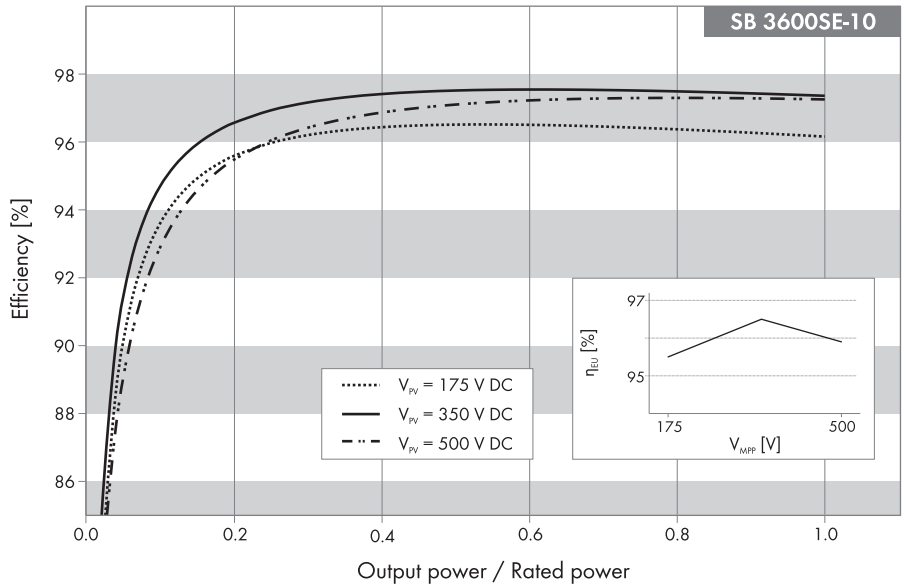
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 130 V | Rated input voltage 365 V | Maximum MPP voltage 500 V |
| 5% | 88.7% | 90.7% | 88.2% |
| 10% | 92.4% | 94.2% | 93.0% |
| 20% | 94.4% | 96.1% | 95.5% |
| 25% | 94.8% | 96.5% | 96.0% |
| 30% | 95.0% | 96.7% | 96.3% |
| 50% | 95.1% | 97.0% | 96.7% |
| 75% | 94.8% | 96.9% | 96.7% |
| 100% | 94.3% | 96.7% | 96.5% |

3.18.2 Derating Behavior



3.19 SB 3600SE-10

3.19.1 PV Efficiency



| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 97.1% |
| European efficiency, η_{EU} | 96.5% |

Efficiency Profile

| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 175 V | Rated input voltage 350 V | Maximum MPP voltage 500 V |
| 5% | 89.8% | 91.2% | 88.8% |
| 10% | 93.3% | 94.4% | 92.6% |
| 20% | 95.2% | 96.2% | 95.1% |
| 25% | 95.6% | 96.5% | 95.7% |
| 30% | 95.8% | 96.8% | 96.0% |
| 50% | 96.1% | 97.1% | 96.7% |
| 75% | 96.0% | 97.1% | 96.9% |
| 100% | 95.8% | 96.9% | 96.8% |

3.19.2 Charge / Discharge Efficiency

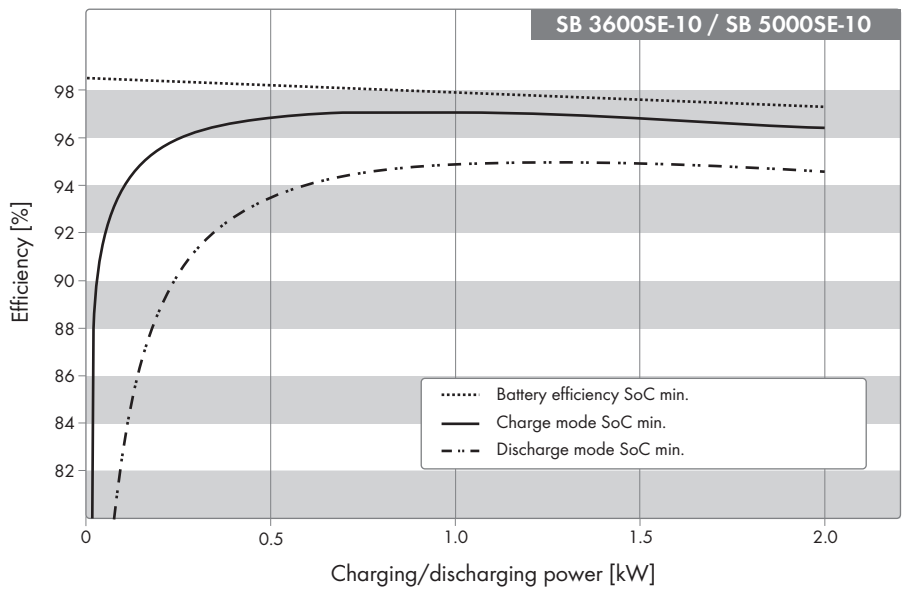


Figure 1: Charge/discharge efficiency SoC min

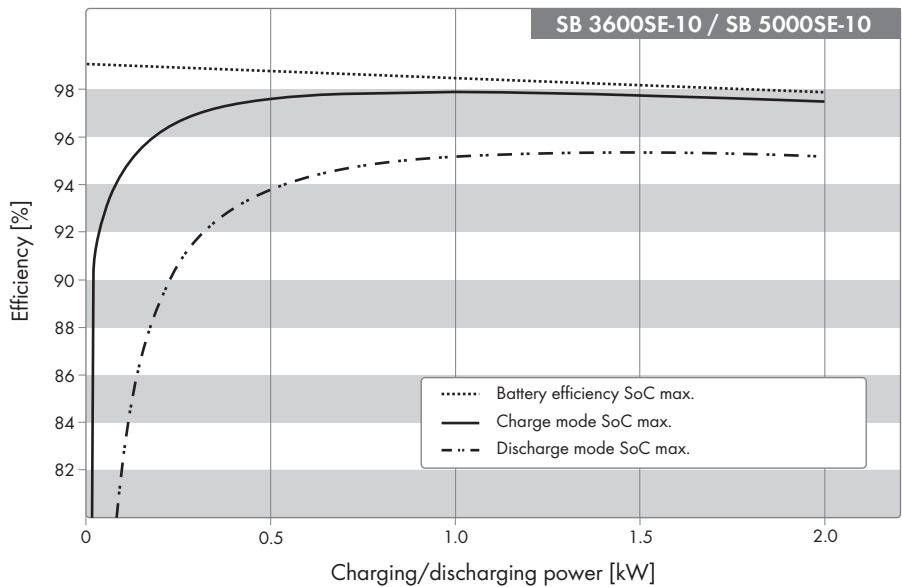
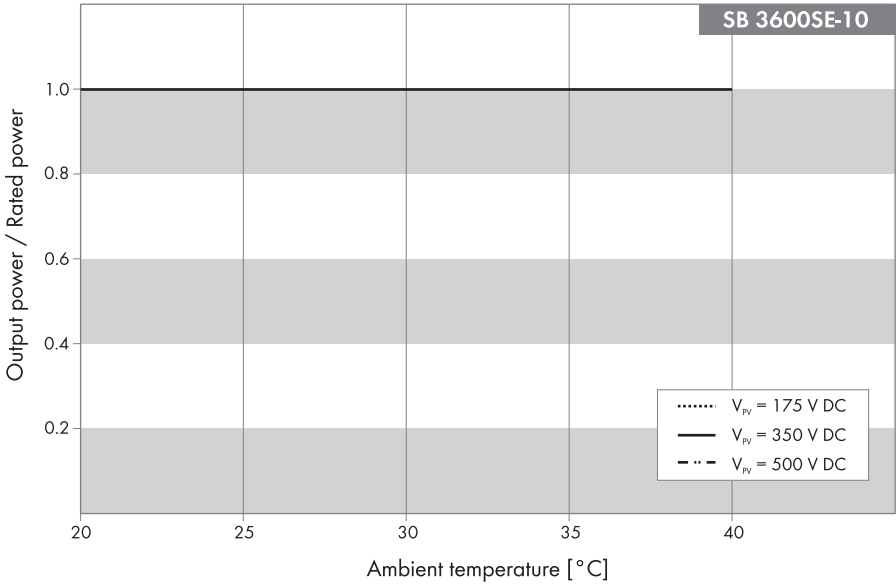


Figure 2: Charge/discharge efficiency SoC max

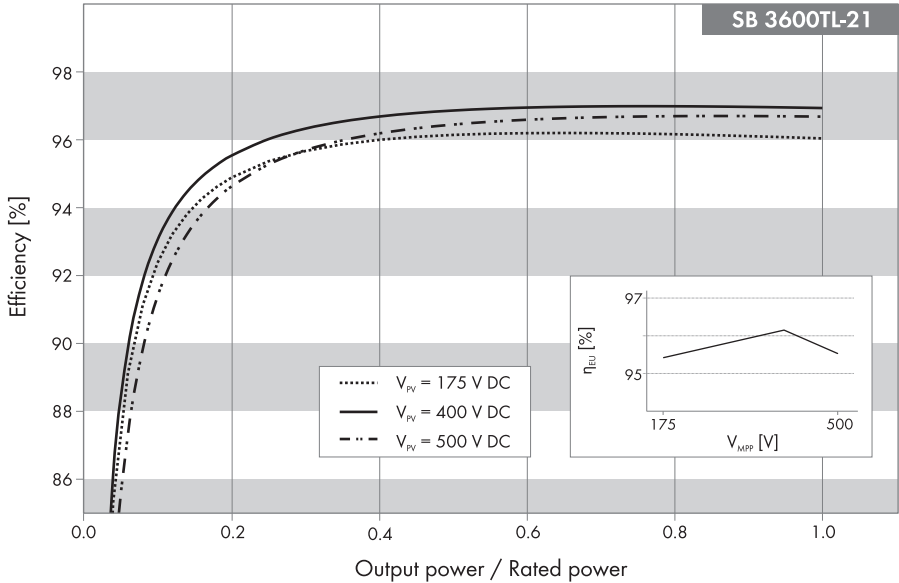
| Maximum efficiency | |
|---|-------|
| Charge mode (PV → battery) SoC max | 98.0% |
| Charge mode (PV → battery) SoC min | 97.2% |
| Discharge mode (battery → utility grid) SoC max | 95.4% |
| Discharge mode (battery → utility grid) SoC min | 95.0% |
| Battery efficiency SoC max | 99.1% |
| Battery efficiency SoC min | 98.5% |

3.19.3 Derating Behavior



3.20 SB 3600TL-21

3.20.1 Efficiency

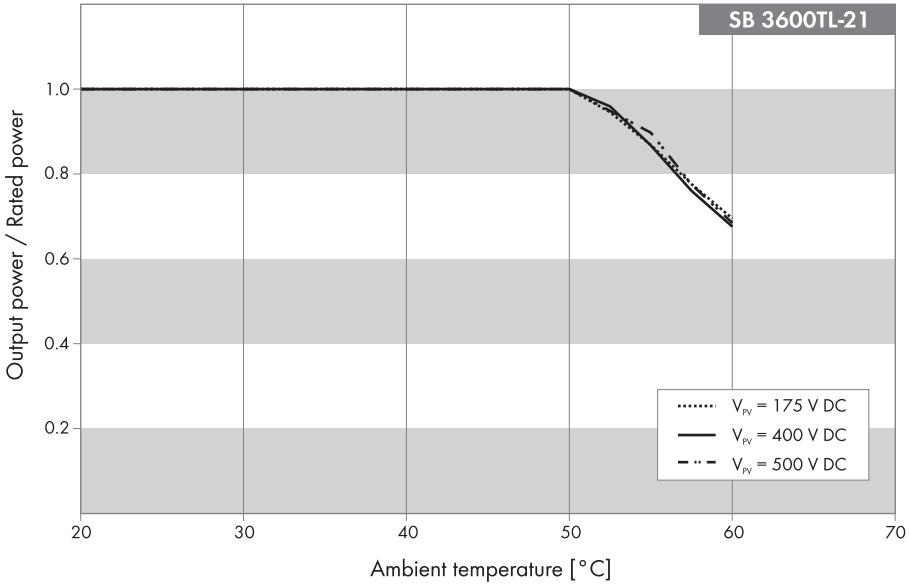


| | |
|---|-------|
| Maximum efficiency, η_{max} | 97.0% |
| European efficiency, η_{EU} | 96.1% |

Efficiency Profile

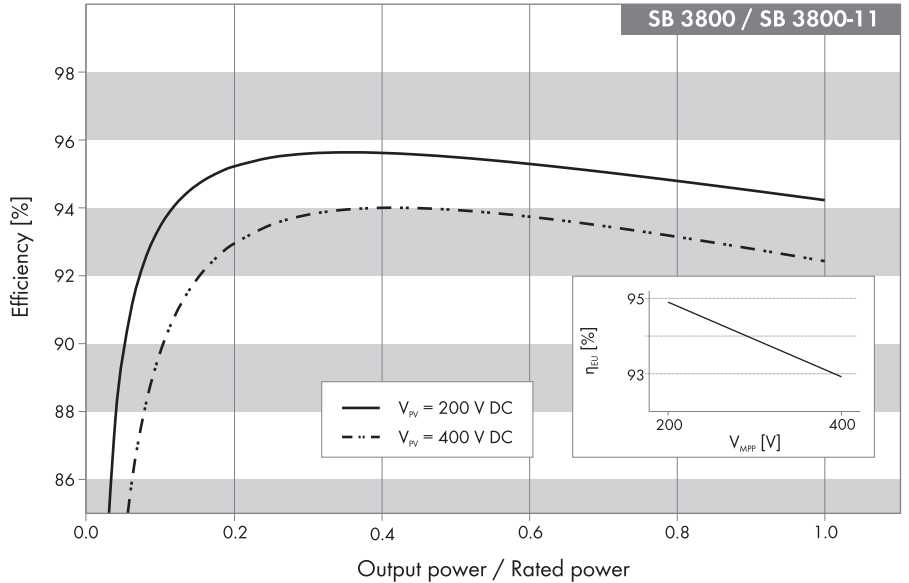
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 175 V | Rated input voltage 400 V | Maximum MPP voltage 500 V |
| 5% | 87.2% | 88.0% | 85.0% |
| 10% | 92.4% | 93.0% | 91.4% |
| 20% | 94.6% | 95.5% | 94.9% |
| 25% | 95.3% | 96.0% | 95.4% |
| 30% | 95.7% | 96.3% | 95.7% |
| 50% | 96.4% | 96.9% | 96.1% |
| 75% | 96.7% | 97.0% | 96.2% |
| 100% | 96.7% | 96.6% | 96.0% |

3.20.2 Derating Behavior



3.21 SB 3800 / SB 3800-11

3.21.1 Efficiency

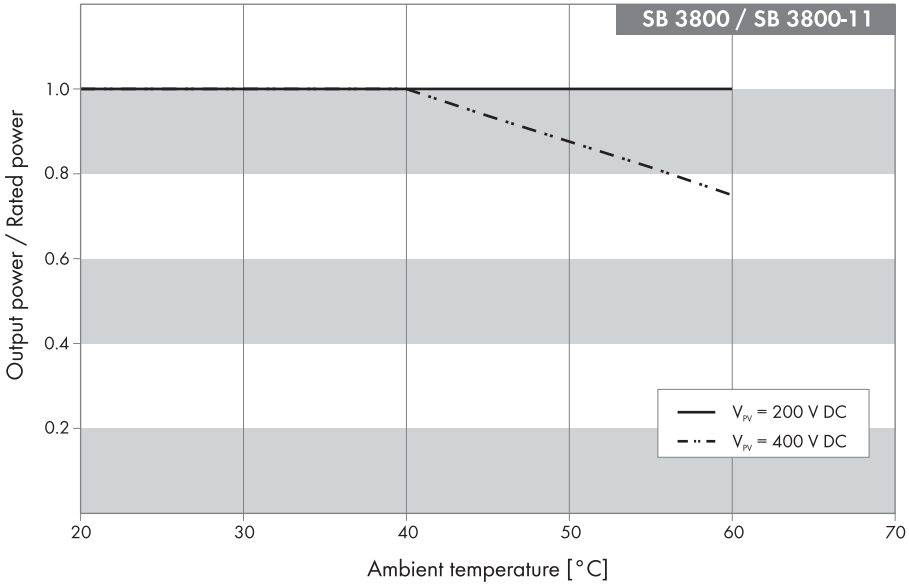


| | |
|---|-------|
| Maximum efficiency, η_{\max} | 95.6% |
| European efficiency, η_{EU} | 94.7% |

Efficiency Profile

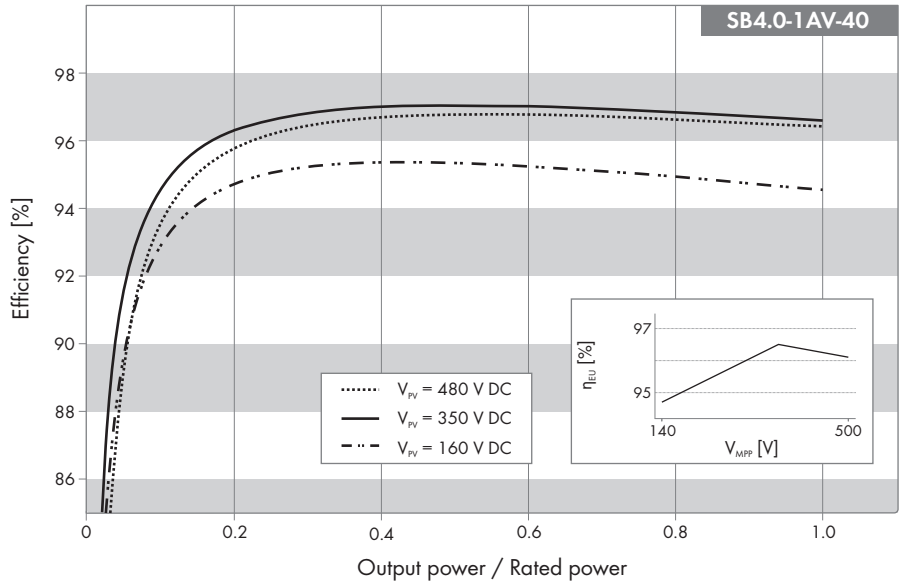
| Standardized output power | Efficiency | |
|---------------------------|---|------------------------------|
| | Minimum MPP voltage / rated input voltage 200 V | Maximum MPP voltage 400 V |
| 5% | 89.3% | 83.3% |
| 10% | 93.4% | 89.7% |
| 20% | 95.2% | 92.9% |
| 25% | 95.5% | 93.5% |
| 30% | 95.6% | 93.8% |
| 50% | 95.4% | 93.9% |
| 75% | 94.8% | 93.3% |
| 100% | 94.1% | 92.4% |

3.21.2 Derating Behavior



3.22 SB4.0-1AV-40

3.22.1 Efficiency



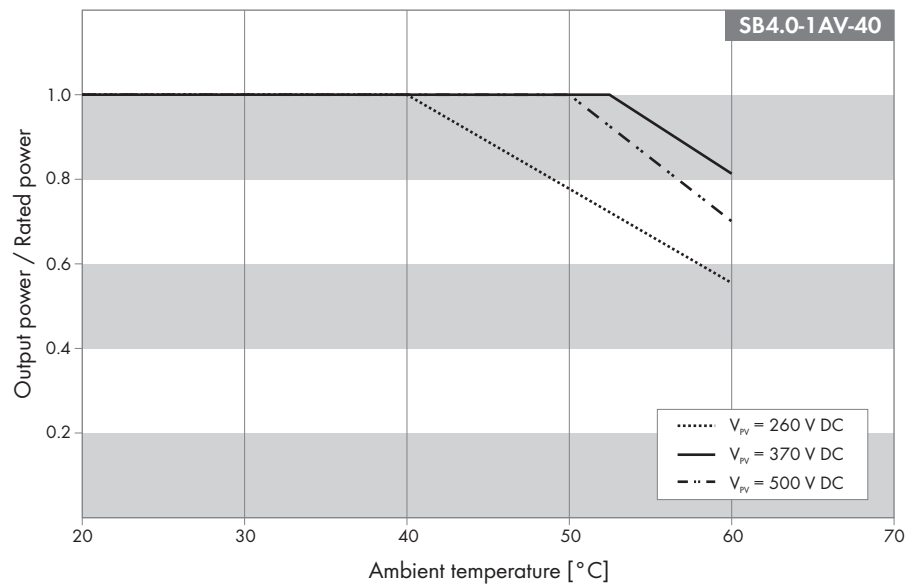
Maximum efficiency, η_{\max} 97.0%

European weighted efficiency, η_{EU} 96.5%

Efficiency Profile

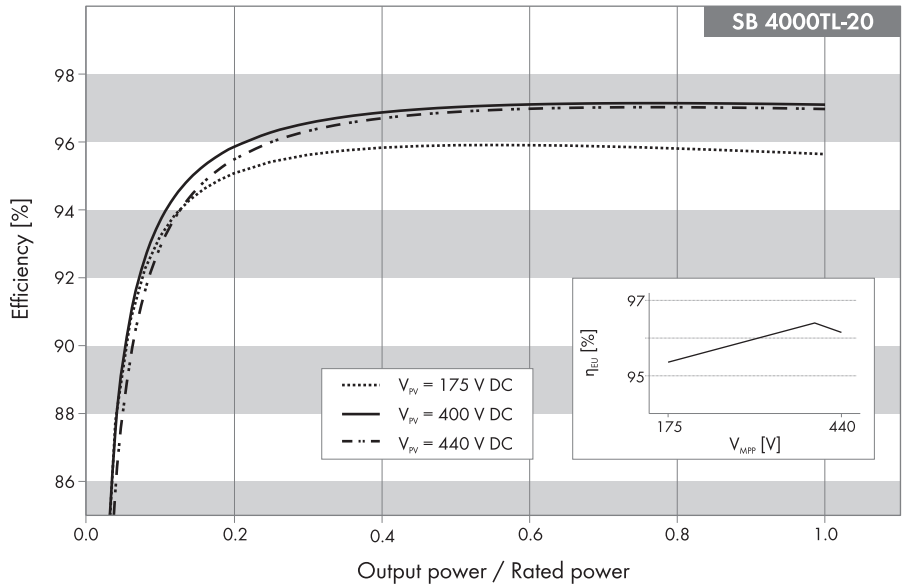
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 140 V | Rated input voltage 365 V | Maximum MPP voltage 500 V |
| 5% | 89.4% | 91.2% | 88.9% |
| 10% | 92.8% | 94.5% | 93.4% |
| 20% | 94.7% | 96.3% | 95.7% |
| 25% | 95.0% | 96.6% | 96.2% |
| 30% | 96.2% | 96.8% | 96.4% |
| 50% | 95.3% | 97.0% | 96.8% |
| 75% | 95.0% | 96.9% | 96.7% |
| 100% | 94.5% | 96.6% | 96.4% |

3.22.2 Derating Behavior



3.23 SB 4000TL-20

3.23.1 Efficiency

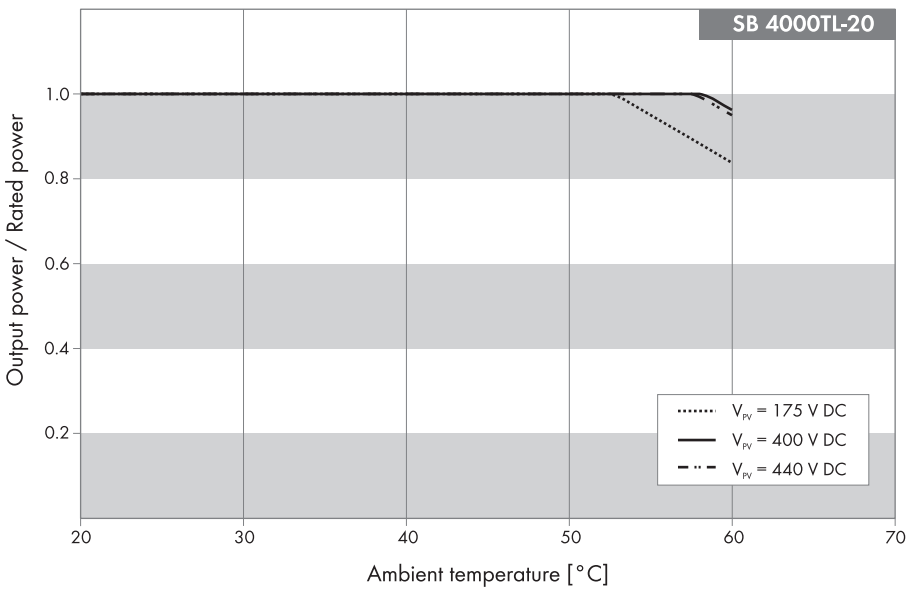


| | |
|---|-------|
| Maximum efficiency, η_{\max} | 97.0% |
| European efficiency, η_{EU} | 96.4% |

Efficiency Profile

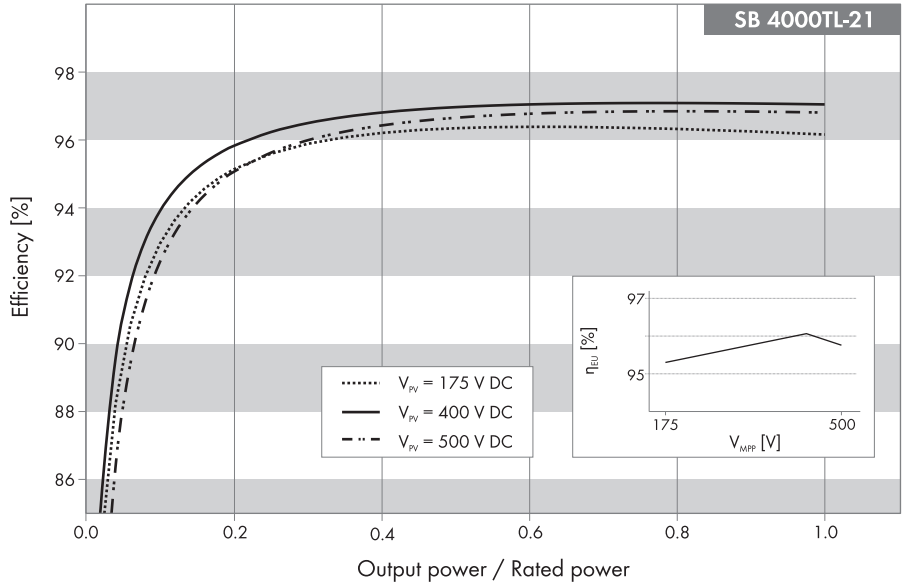
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 175 V | Rated input voltage 400 V | Maximum MPP voltage 440 V |
| 5% | 89.3% | 89.2% | 87.6% |
| 10% | 93.2% | 93.7% | 92.9% |
| 20% | 95.1% | 95.9% | 95.5% |
| 25% | 95.4% | 96.3% | 96.0% |
| 30% | 95.6% | 96.6% | 96.3% |
| 50% | 95.0% | 97.0% | 96.9% |
| 75% | 95.8% | 97.0% | 96.9% |
| 100% | 95.6% | 97.0% | 96.9% |

3.23.2 Derating Behavior



3.24 SB 4000TL-21

3.24.1 Efficiency

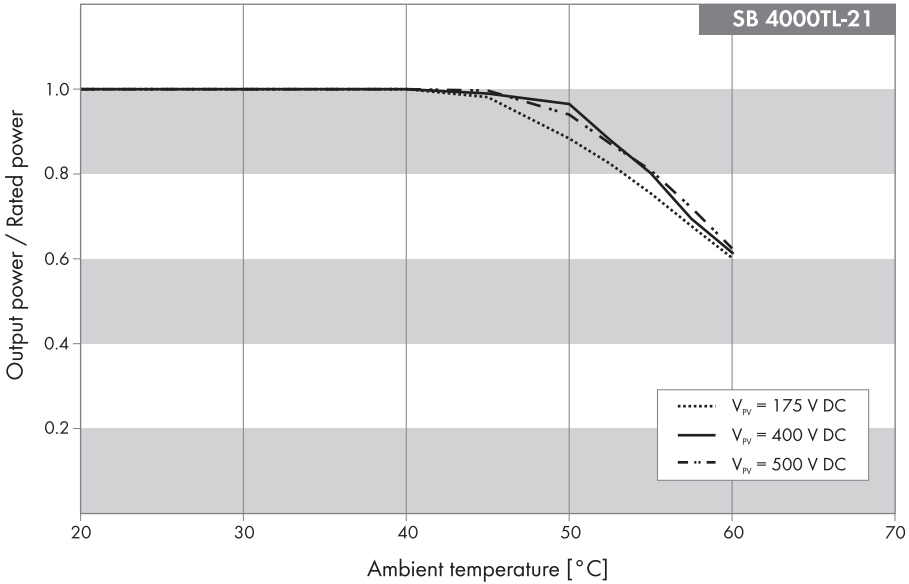


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 97.1% |
| European efficiency, η_{EU} | 96.4% |

Efficiency Profile

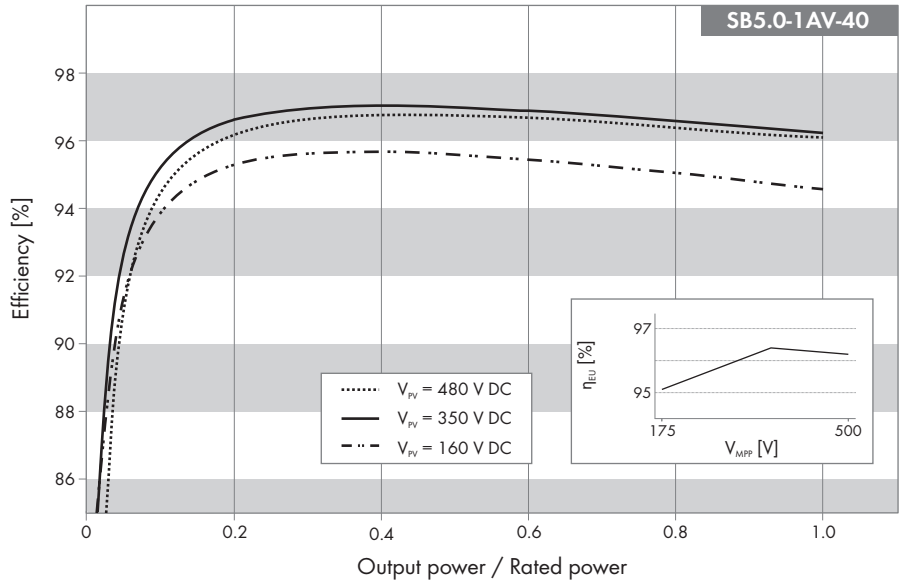
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 175 V | Rated input voltage 400 V | Maximum MPP voltage 500 V |
| 5% | 89.4% | 90.6% | 89.9% |
| 10% | 92.9% | 93.9% | 92.4% |
| 20% | 95.1% | 95.8% | 95.1% |
| 25% | 95.6% | 96.2% | 95.6% |
| 30% | 95.9% | 96.5% | 96.0% |
| 50% | 96.3% | 97.0% | 96.6% |
| 75% | 96.3% | 97.1% | 96.8% |
| 100% | 96.1% | 97.0% | 96.8% |

3.24.2 Derating Behavior



3.25 SB5.0-1AV-40

3.25.1 Efficiency

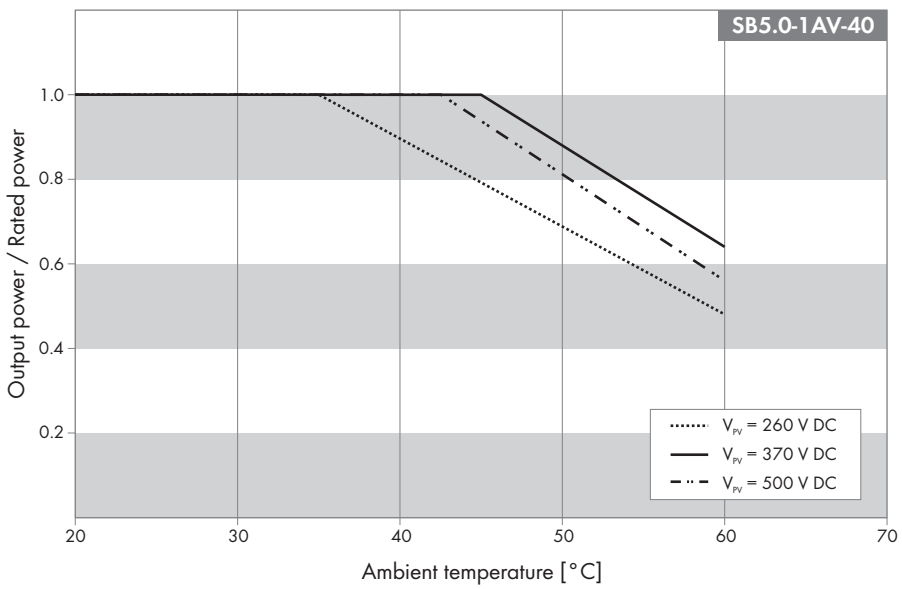


| | |
|--|-------|
| Maximum efficiency, η_{\max} | 97.0% |
| European weighted efficiency, η_{EU} | 96.5% |

Efficiency Profile

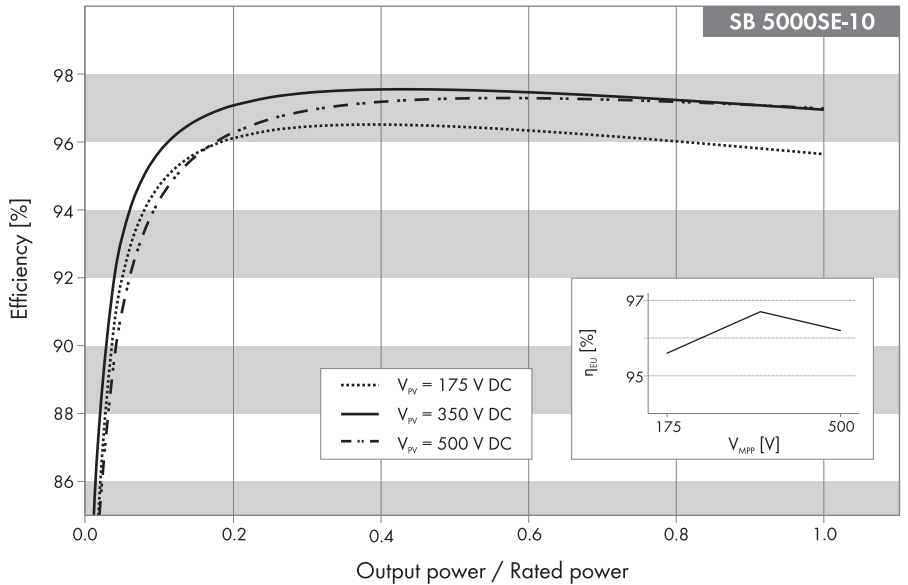
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 175 V | Rated input voltage 365 V | Maximum MPP voltage 500 V |
| 5% | 91.2% | 92.5% | 90.7% |
| 10% | 93.8% | 95.2% | 94.4% |
| 20% | 95.3% | 96.6% | 96.2% |
| 25% | 95.5% | 96.8% | 96.5% |
| 30% | 95.6% | 97.0% | 96.6% |
| 50% | 95.6% | 97.0% | 96.8% |
| 75% | 95.2% | 96.7% | 96.5% |
| 100% | 94.6% | 96.2% | 96.1% |

3.25.2 Derating Behavior



3.26 SB 5000SE-10

3.26.1 PV Efficiency



| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 97.1% |
| European efficiency, η_{EU} | 96.7% |

Efficiency Profile

| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 175 V | Rated input voltage 350 V | Maximum MPP voltage 500 V |
| 5% | 91.7% | 92.9% | 90.8% |
| 10% | 94.4% | 95.3% | 94.0% |
| 20% | 95.7% | 96.7% | 95.9% |
| 25% | 96.0% | 96.9% | 96.3% |
| 30% | 96.1% | 97.0% | 96.5% |
| 50% | 96.1% | 97.1% | 96.9% |
| 75% | 95.7% | 96.9% | 96.8% |
| 100% | 95.3% | 96.6% | 96.6% |

3.26.2 Charge / Discharge Efficiency

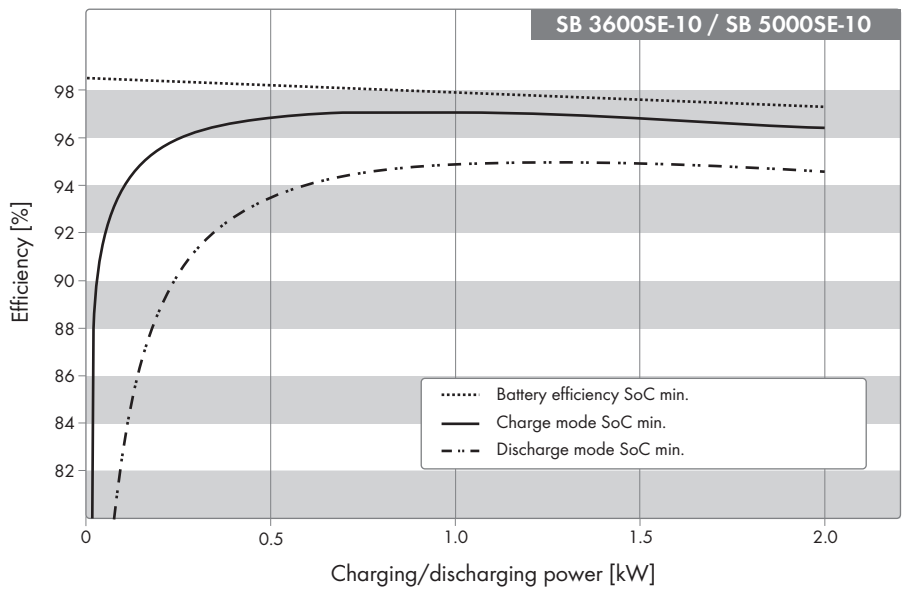


Figure 3: Charge/discharge efficiency SoC min

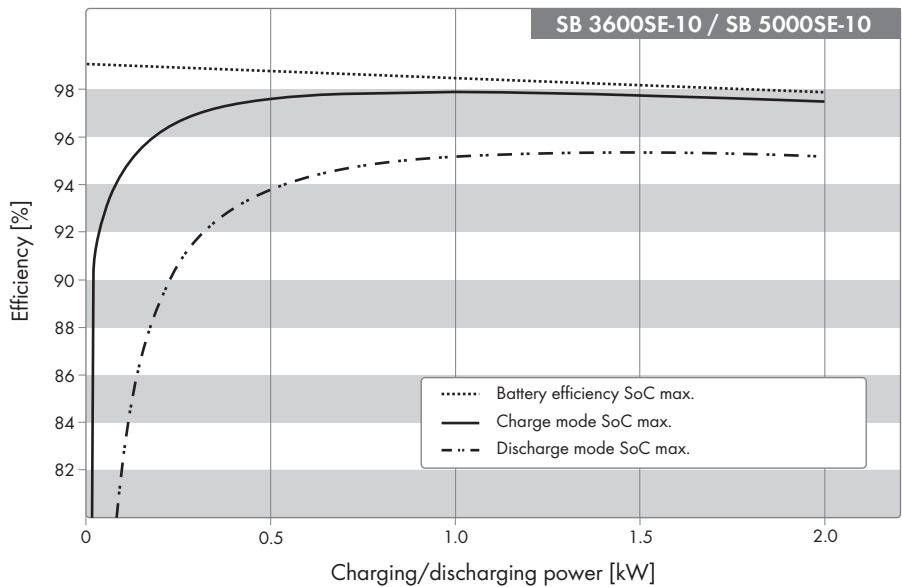
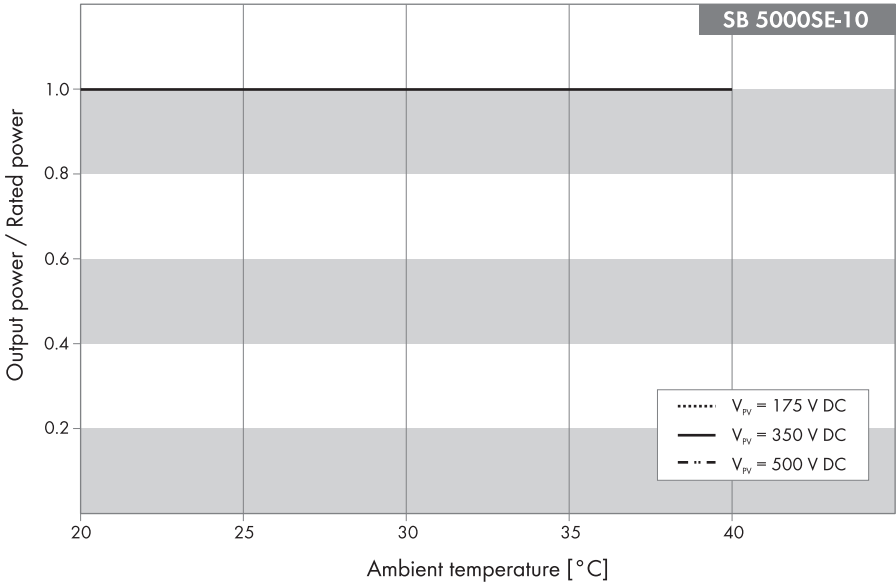


Figure 4: Charge/discharge efficiency SoC max

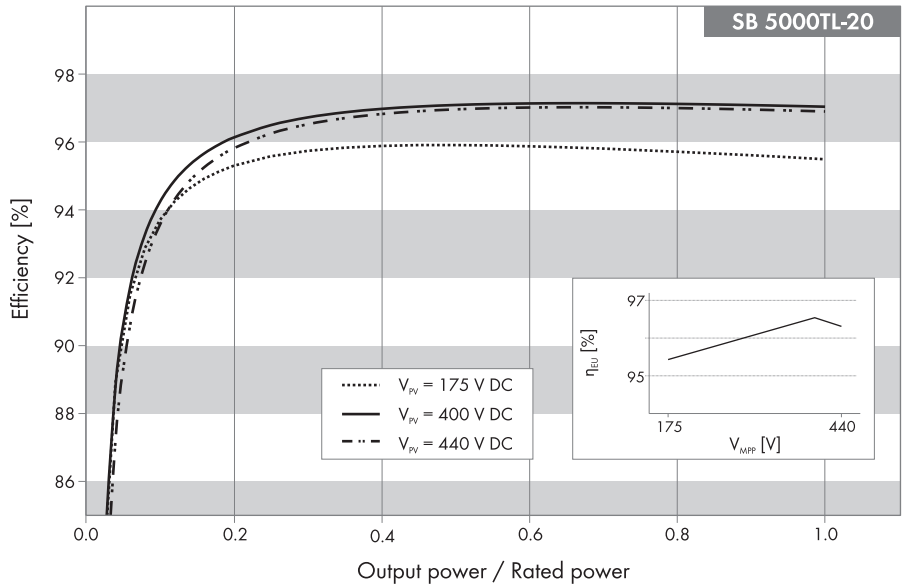
| Maximum efficiency | |
|---|-------|
| Charge mode (PV → battery) SoC max | 98.0% |
| Charge mode (PV → battery) SoC min | 97.2% |
| Discharge mode (battery → utility grid) SoC max | 95.4% |
| Discharge mode (battery → utility grid) SoC min | 95.0% |
| Battery efficiency SoC max | 99.1% |
| Battery efficiency SoC min | 98.5% |

3.26.3 Derating Behavior



3.27 SB 5000TL-20

3.27.1 Efficiency

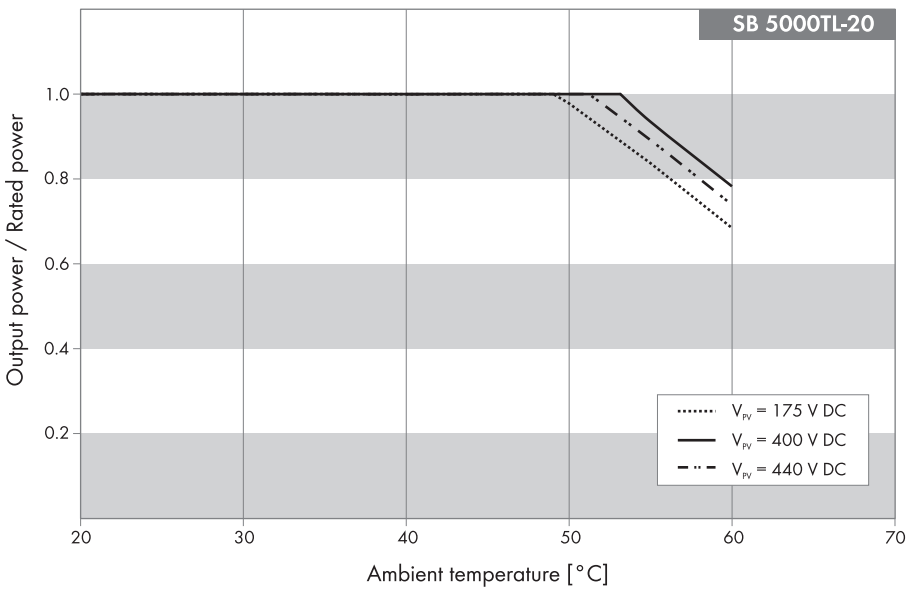


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 97.0% |
| European efficiency, η_{EU} | 96.5% |

Efficiency Profile

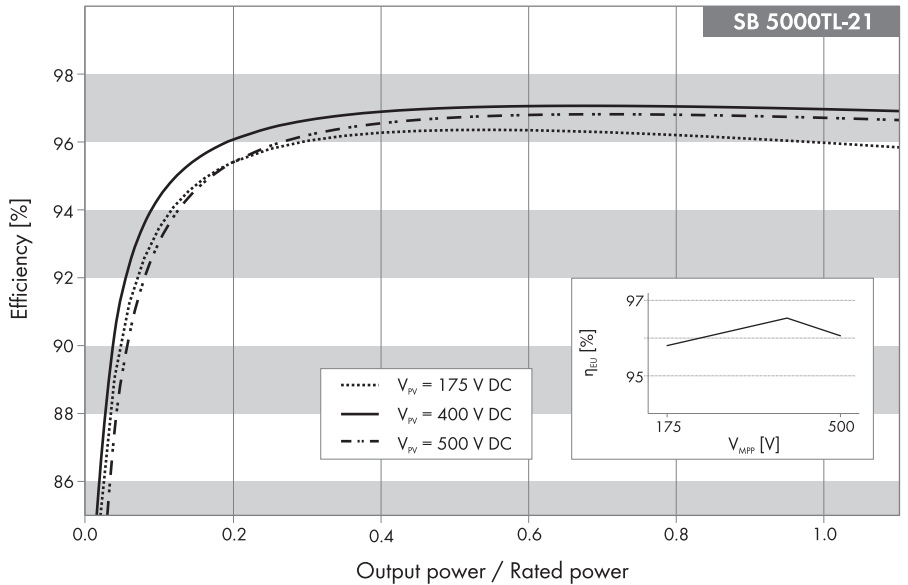
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 175 V | Rated input voltage 400 V | Maximum MPP voltage 440 V |
| 5% | 90.2% | 90.3% | 88.9% |
| 10% | 93.7% | 94.2% | 93.6% |
| 20% | 95.3% | 96.1% | 95.8% |
| 25% | 95.6% | 96.5% | 96.3% |
| 30% | 95.7% | 96.7% | 96.5% |
| 50% | 95.9% | 97.0% | 97.0% |
| 75% | 95.8% | 97.0% | 97.0% |
| 100% | 95.5% | 97.0% | 96.9% |

3.27.2 Derating Behavior



3.28 SB 5000TL-21

3.28.1 Efficiency

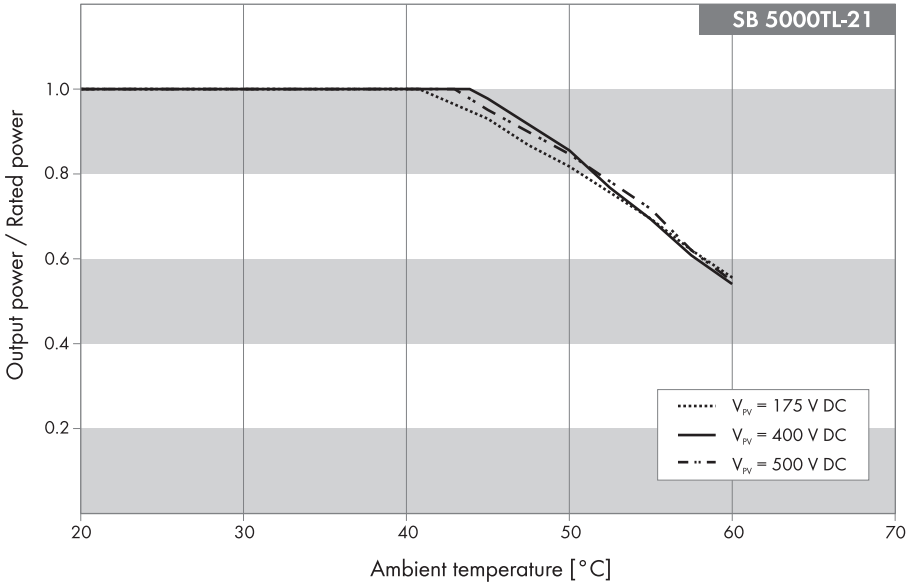


| | |
|--|-------|
| Maximum efficiency, η_{\max} | 97.1% |
| European weighted efficiency, η_{EU} | 96.5% |

Efficiency Profile

| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 175 V | Rated input voltage 400 V | Maximum MPP voltage 500 V |
| 5% | 90.2% | 91.4% | 88.9% |
| 10% | 93.5% | 94.4% | 93.1% |
| 20% | 95.4% | 96.1% | 95.4% |
| 25% | 95.8% | 96.4% | 95.9% |
| 30% | 96.1% | 96.7% | 96.2% |
| 50% | 96.4% | 97.0% | 96.7% |
| 75% | 96.3% | 97.1% | 96.8% |
| 100% | 96.0% | 97.0% | 96.7% |

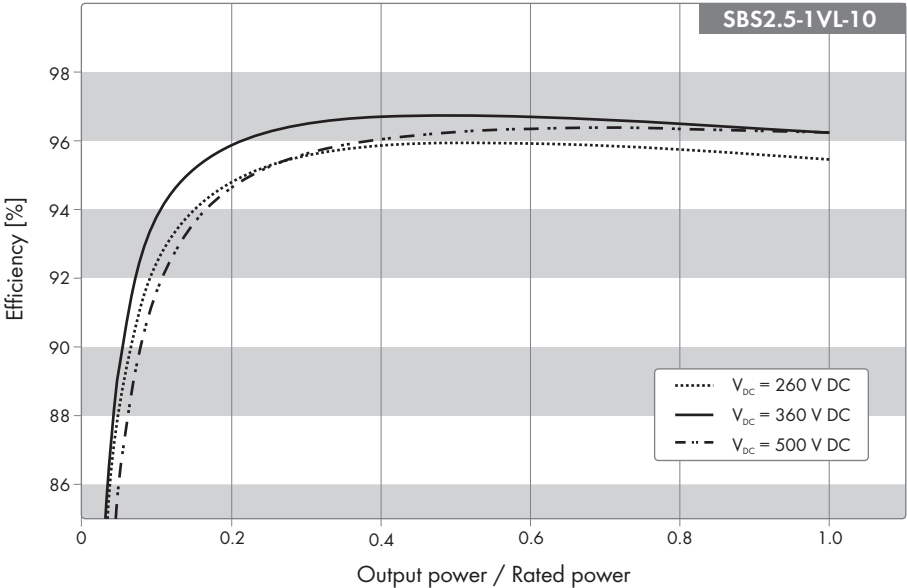
3.28.2 Derating Behavior



4 Sunny Boy Storage

4.1 SBS2.5-1VL-10

4.1.1 DC Efficiency



Maximum efficiency, η_{\max} 96.7%

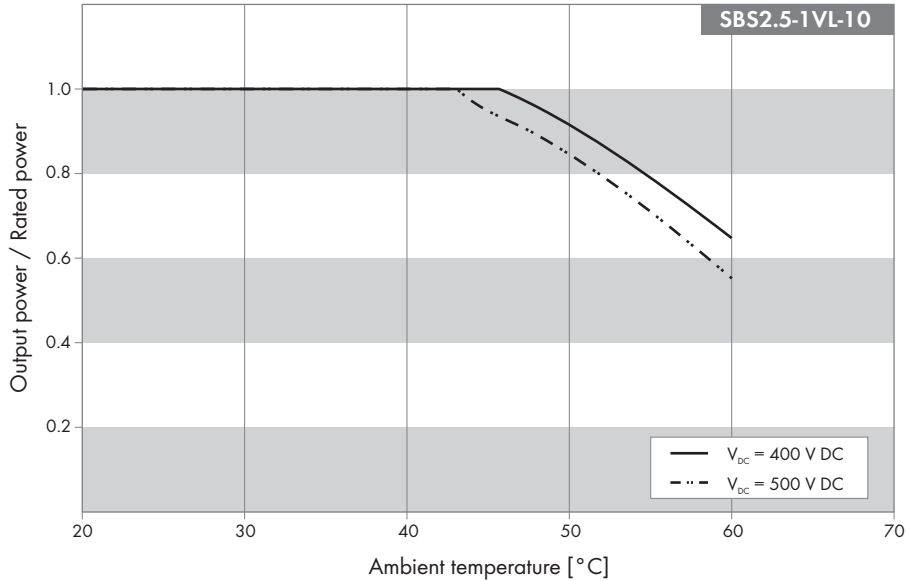
European weighted efficiency, η_{EU} 96.1%

Efficiency Profile

| Standardized output power | Efficiency | | |
|---------------------------|-----------------------------|------------------------------|-----------------------------|
| | Minimum DC voltage 260 V | Rated input voltage 360 V | Maximum DC voltage 500 V |
| 5% | 87.9% | 89.2% | 85.7% |
| 10% | 92.3% | 93.6% | 91.5% |
| 20% | 94.8% | 95.8% | 94.6% |
| 25% | 95.3% | 96.2% | 95.2% |
| 30% | 95.5% | 96.5% | 95.6% |
| 50% | 95.9% | 96.7% | 96.2% |

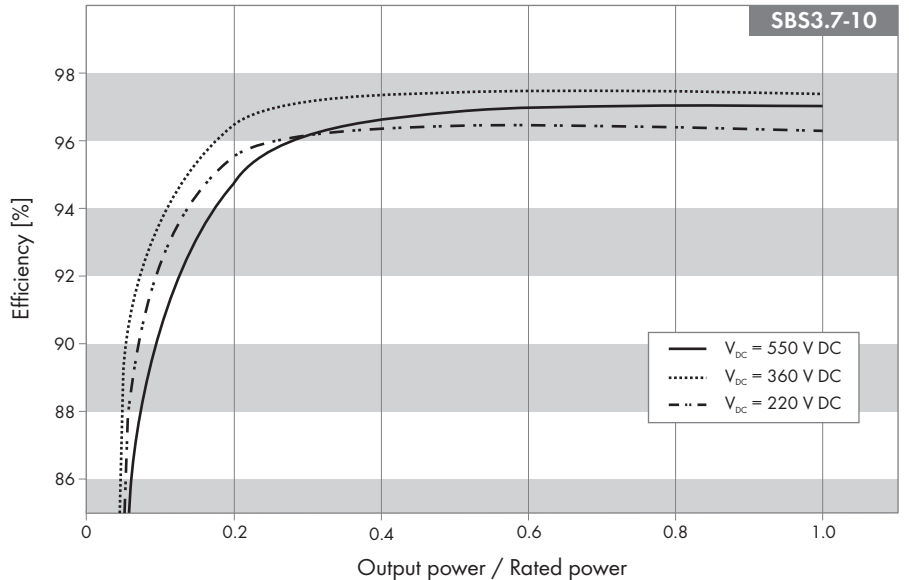
| Standardized output power | Efficiency | | |
|---------------------------|-----------------------------|------------------------------|-----------------------------|
| | Minimum DC voltage 260 V | Rated input voltage 360 V | Maximum DC voltage 500 V |
| 75% | 95.8% | 96.5% | 96.3% |
| 100% | 95.4% | 96.2% | 96.2% |

4.1.2 Derating Behavior



4.2
SBS3.7-10

4.2.1
DC Efficiency

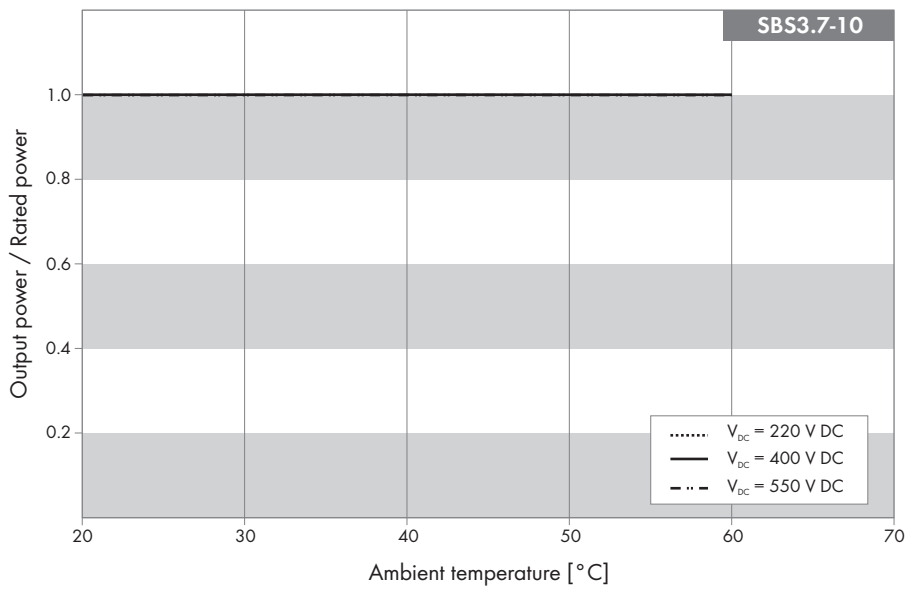


Maximum efficiency
97.5 %

Efficiency Profile

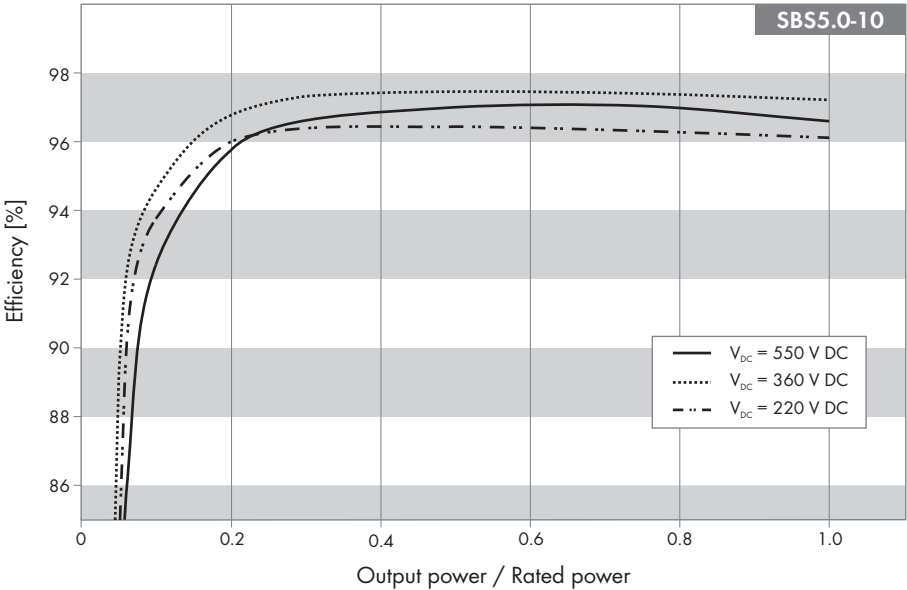
| Standardized output power | Efficiency | | |
|---------------------------|-----------------------------|------------------------------|-----------------------------|
| | Minimum DC voltage 220 V | Rated input voltage 360 V | Maximum DC voltage 550 V |
| 10 % | 92.7 % | 93.6 % | 88.6 % |
| 20 % | 95.5 % | 96.5 % | 94.7 % |
| 30 % | 96.1 % | 97.1 % | 96.1 % |
| 50 % | 96.4 % | 97.4 % | 96.8 % |
| 75 % | 96.4 % | 97.5 % | 97.0 % |
| 100 % | 96.3 % | 97.4 % | 97.0 % |

4.2.2 Derating Behavior



4.3 SBS5.0-10

4.3.1 DC Efficiency

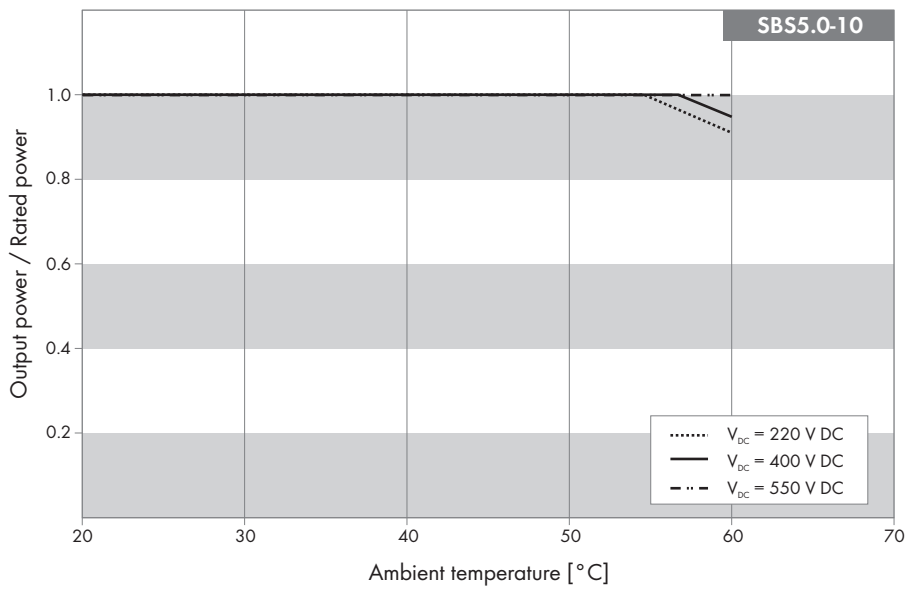


Maximum efficiency 97.5 %

Efficiency Profile

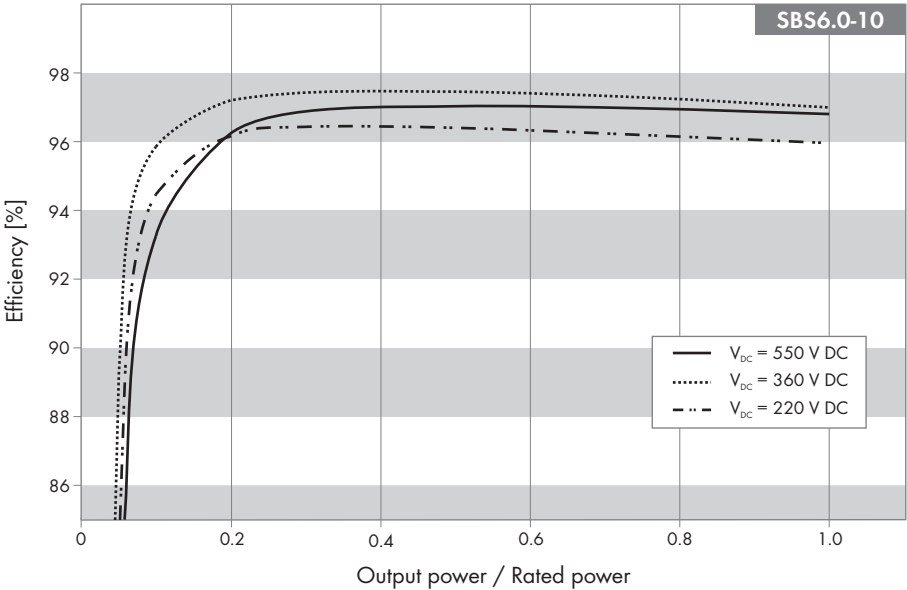
| Standardized output power | Efficiency | | |
|---------------------------|-----------------------------|------------------------------|-----------------------------|
| | Minimum DC voltage 220 V | Rated input voltage 360 V | Maximum DC voltage 550 V |
| 10 % | 93.8 % | 94.6 % | 92.4 % |
| 20 % | 96.0 % | 96.9 % | 92.4 % |
| 30 % | 96.4 % | 97.3 % | 96.5 % |
| 50 % | 96.4 % | 97.5 % | 97.0 % |
| 75 % | 96.3 % | 97.4 % | 97.0 % |
| 100 % | 96.1 % | 97.2 % | 96.6 % |

4.3.2 Derating Behavior



4.4 SBS6.0-10

4.4.1 DC Efficiency

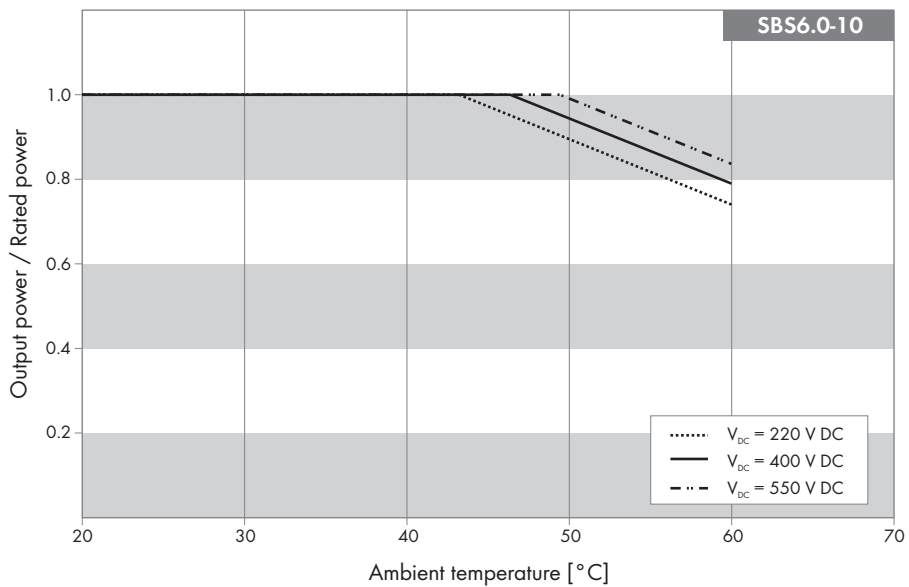


Maximum efficiency 97.5 %

Efficiency Profile

| Standardized output power | Efficiency | | |
|---------------------------|-----------------------------|------------------------------|-----------------------------|
| | Minimum DC voltage 220 V | Rated input voltage 360 V | Maximum DC voltage 550 V |
| 10 % | 94.5 % | 95.8 % | 93.3 % |
| 20 % | 96.2 % | 97.2 % | 96.2 % |
| 30 % | 96.4 % | 97.4 % | 96.8 % |
| 50 % | 96.4 % | 97.5 % | 97.0 % |
| 75 % | 96.2 % | 97.3 % | 97.0 % |
| 100 % | 96.0 % | 97.0 % | 96.8 % |

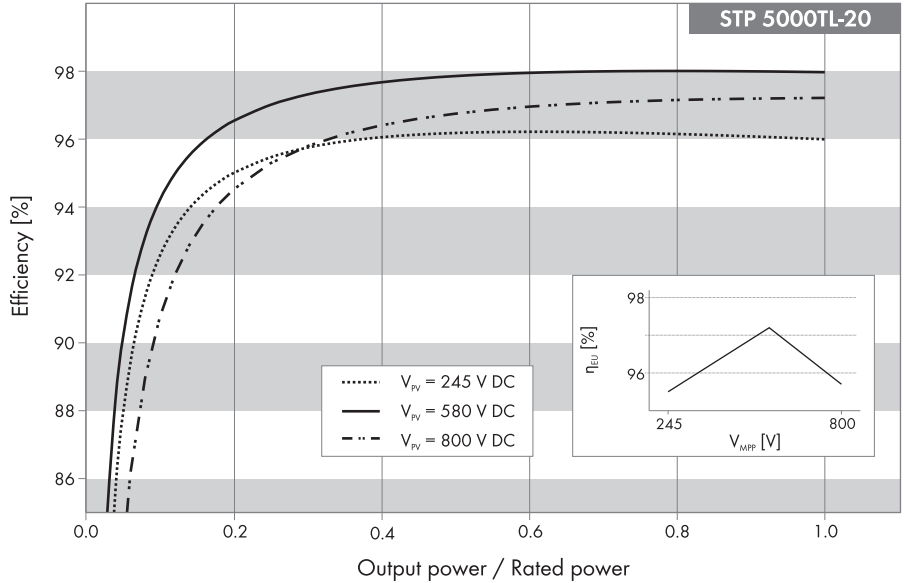
4.4.2 Derating Behavior



5 Sunny Tripower

5.1 STP 5000TL-20

5.1.1 Efficiency



Maximum efficiency, η_{\max} 98.0%

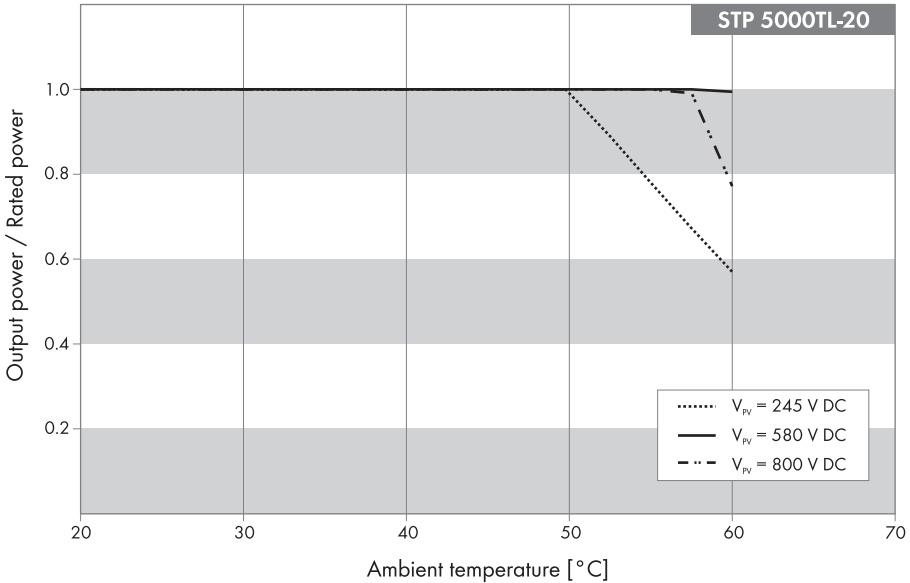
European efficiency, η_{EU} 97.2%

Efficiency Profile

| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 245 V | Rated input voltage 580 V | Maximum MPP voltage 800 V |
| 5% | 87.8% | 90.1% | 84.0% |
| 10% | 92.6% | 94.2% | 90.8% |
| 20% | 95.0% | 96.5% | 94.5% |
| 25% | 95.5% | 97.0% | 95.3% |
| 30% | 95.7% | 97.3% | 95.8% |
| 50% | 96.2% | 97.9% | 96.7% |

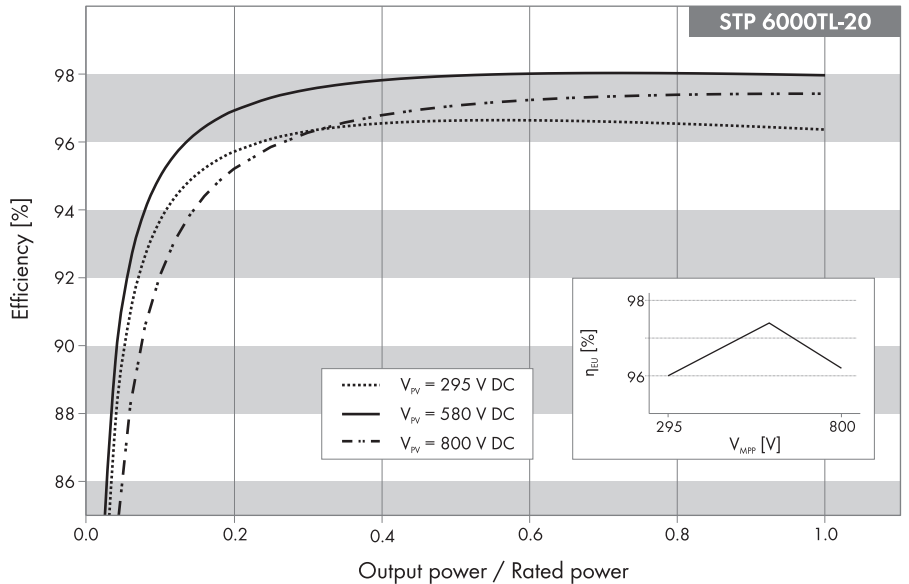
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 245 V | Rated input voltage 580 V | Maximum MPP voltage 800 V |
| 75% | 96.2% | 98.0% | 97.1% |
| 100% | 96.0% | 98.0% | 97.2% |

5.1.2 Derating Behavior



5.2 STP 6000TL-20

5.2.1 Efficiency

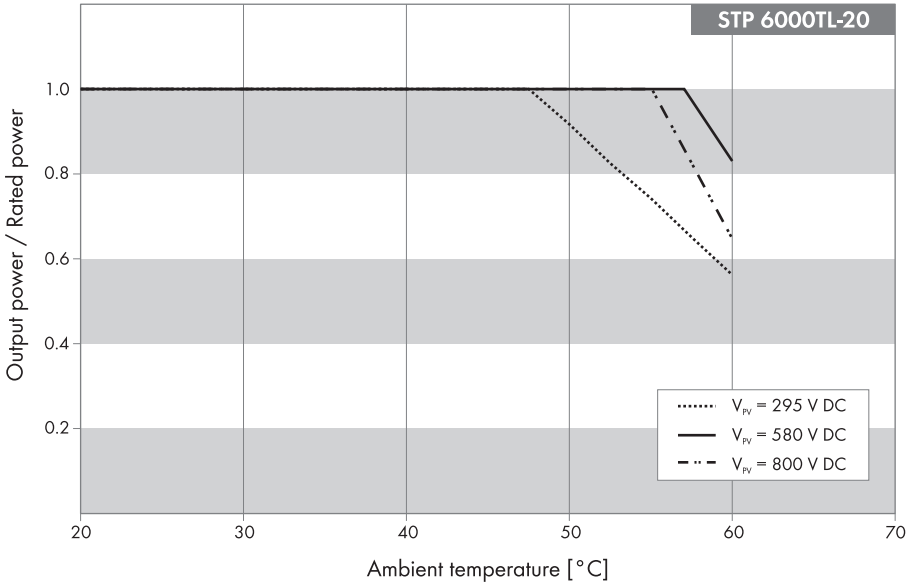


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 98.0% |
| European efficiency, η_{EU} | 97.4% |

Efficiency Profile

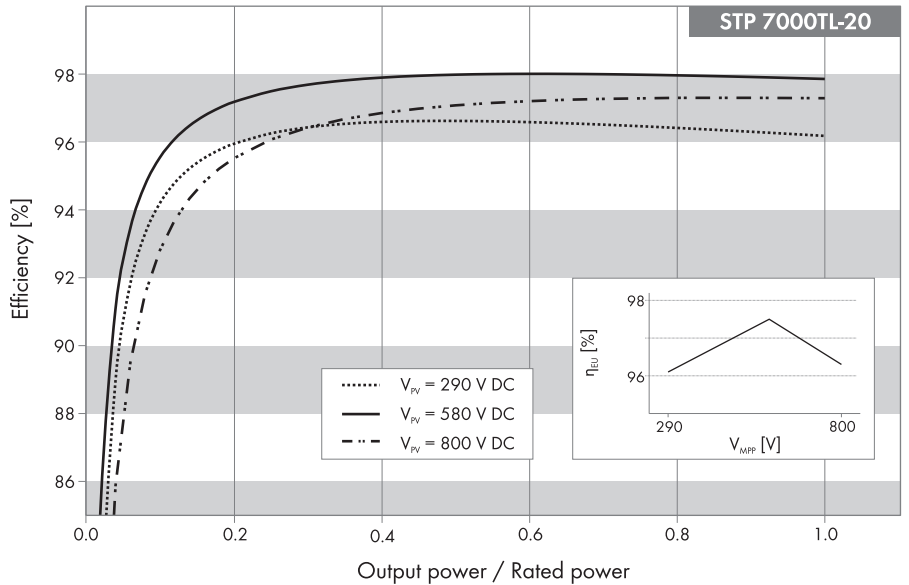
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 295 V | Rated input voltage 580 V | Maximum MPP voltage 800 V |
| 5% | 89.7% | 91.3% | 86.5% |
| 10% | 93.7% | 95.0% | 92.1% |
| 20% | 95.7% | 96.9% | 95.2% |
| 25% | 96.1% | 97.3% | 95.9% |
| 30% | 96.3% | 97.5% | 96.3% |
| 50% | 96.6% | 98.0% | 97.1% |
| 75% | 96.6% | 98.0% | 97.4% |
| 100% | 96.4% | 98.0% | 97.4% |

5.2.2 Derating Behavior



5.3 STP 7000TL-20

5.3.1 Efficiency

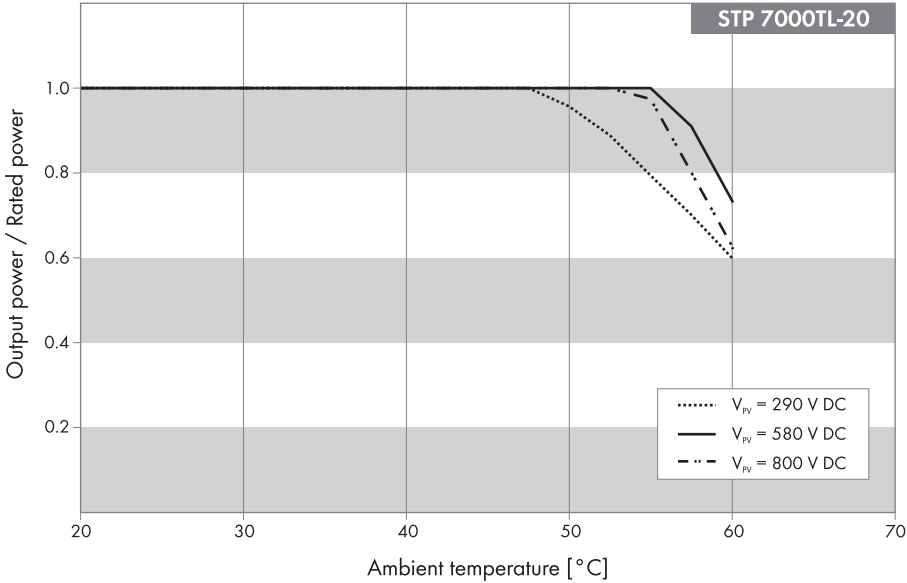


| | |
|-----------------------------------|-------|
| Maximum efficiency, η_{\max} | 98.0% |
| European efficiency, η_{EU} | 97.5% |

Efficiency Profile

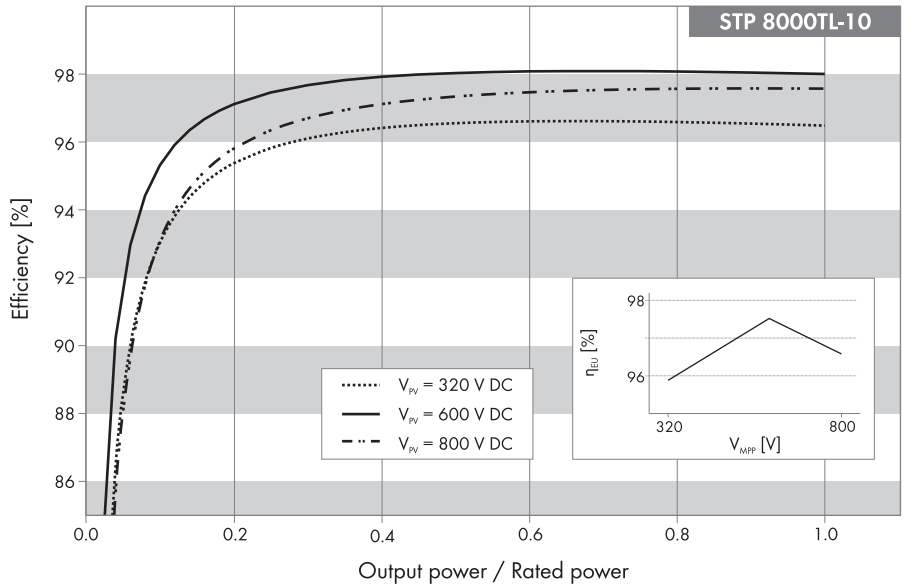
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 290 V | Rated input voltage 580 V | Maximum MPP voltage 600 V |
| 5% | 90.7% | 92.5% | 88.0% |
| 10% | 94.2% | 95.5% | 92.8% |
| 20% | 95.9% | 97.2% | 95.5% |
| 25% | 96.3% | 97.5% | 96.1% |
| 30% | 96.4% | 97.7% | 96.4% |
| 50% | 96.6% | 98.0% | 97.1% |
| 75% | 96.5% | 98.0% | 97.3% |
| 100% | 96.2% | 97.9% | 97.3% |

5.3.2 Derating Behavior



5.4 STP 8000TL-10

5.4.1 Efficiency

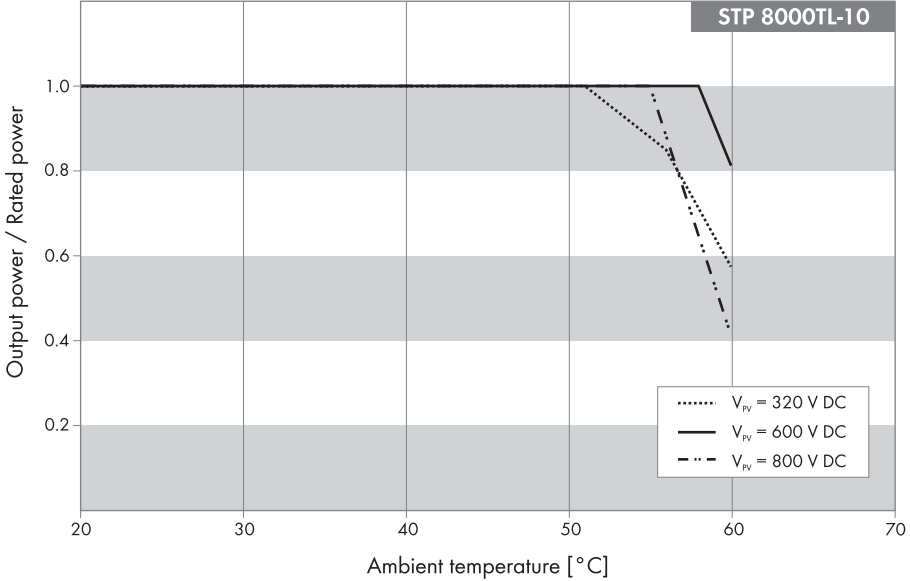


| | |
|-----------------------------------|-------|
| Maximum efficiency, η_{\max} | 98.1% |
| European efficiency, η_{EU} | 97.5% |

Efficiency Profile

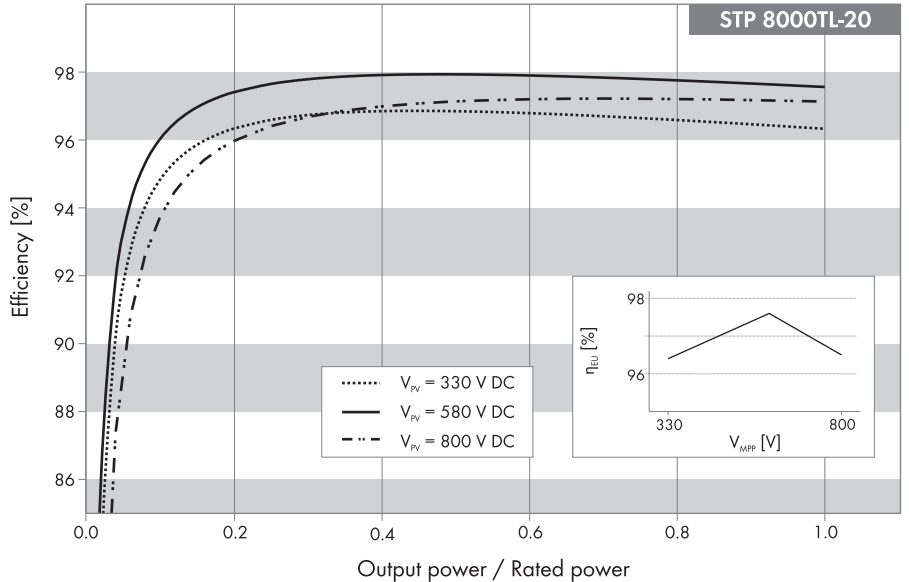
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 320 V | Rated input voltage 600 V | Maximum MPP voltage 800 V |
| 5% | 88.2% | 91.6% | 87.6% |
| 10% | 93.0% | 95.3% | 93.1% |
| 20% | 95.4% | 97.1% | 95.8% |
| 25% | 95.8% | 97.5% | 96.3% |
| 30% | 96.1% | 97.7% | 96.7% |
| 50% | 96.6% | 98.0% | 97.3% |
| 75% | 96.6% | 98.1% | 97.6% |
| 100% | 96.5% | 98.0% | 97.6% |

5.4.2 Derating Behavior



5.5 STP 8000TL-20

5.5.1 Efficiency

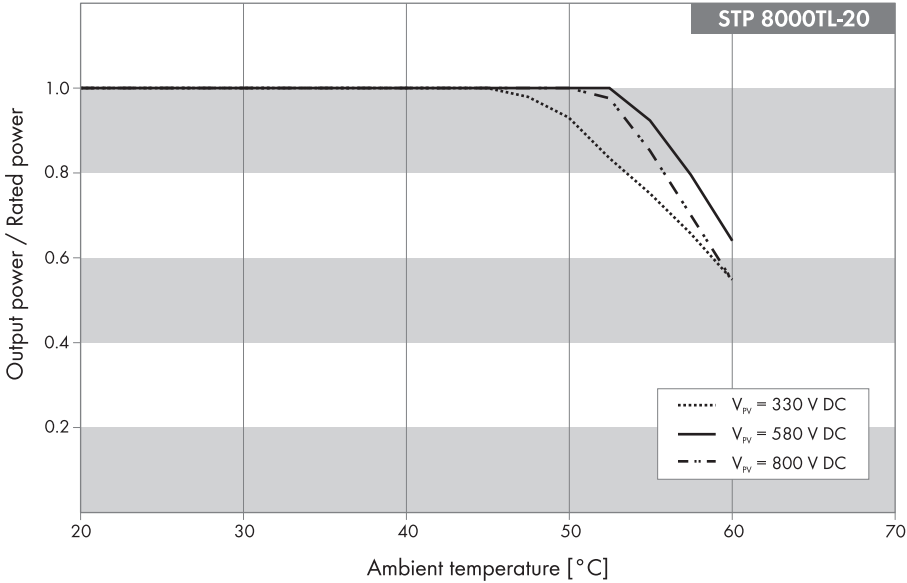


| | |
|-----------------------------------|-------|
| Maximum efficiency, η_{\max} | 98.0% |
| European efficiency, η_{EU} | 97.6% |

Efficiency Profile

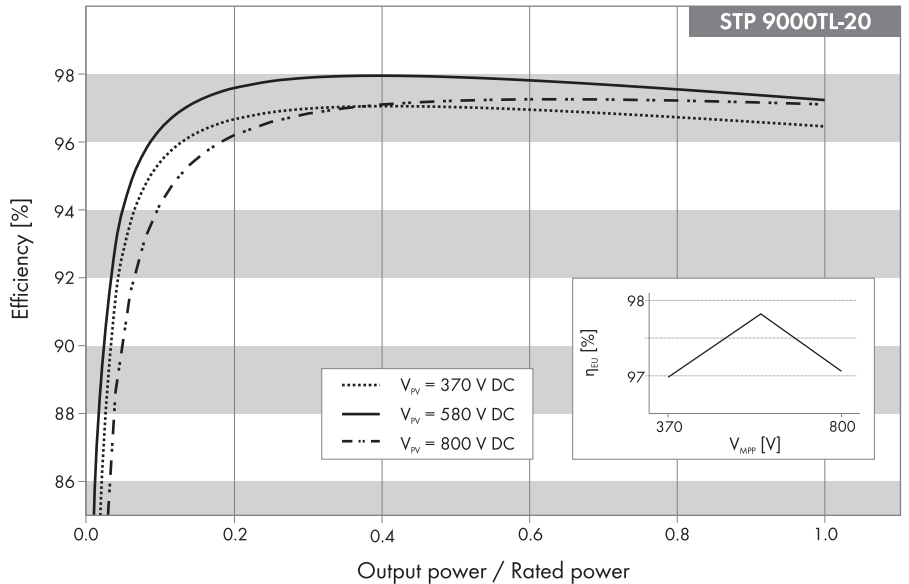
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 330 V | Rated input voltage 580 V | Maximum MPP voltage 800 V |
| 5% | 91.7% | 93.2% | 89.4% |
| 10% | 94.8% | 96.0% | 93.7% |
| 20% | 96.3% | 97.4% | 96.0% |
| 25% | 96.6% | 97.7% | 96.4% |
| 30% | 96.7% | 97.8% | 96.7% |
| 50% | 96.9% | 98.0% | 97.1% |
| 75% | 96.7% | 97.8% | 97.2% |
| 100% | 96.3% | 97.6% | 97.1% |

5.5.2 Derating Behavior



5.6 STP 9000TL-20

5.6.1 Efficiency



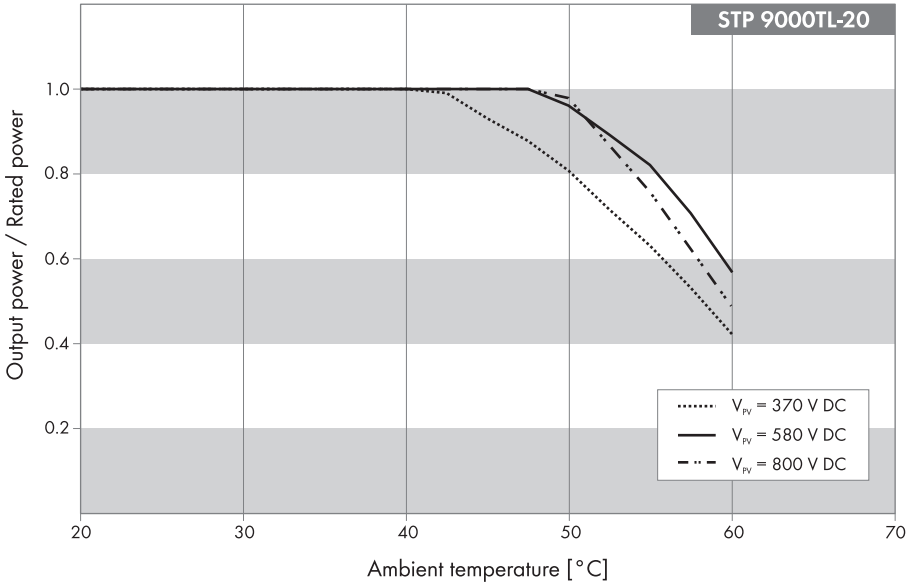
Maximum efficiency, η_{max} 98.0%

European efficiency, η_{EU} 97.6%

Efficiency Profile

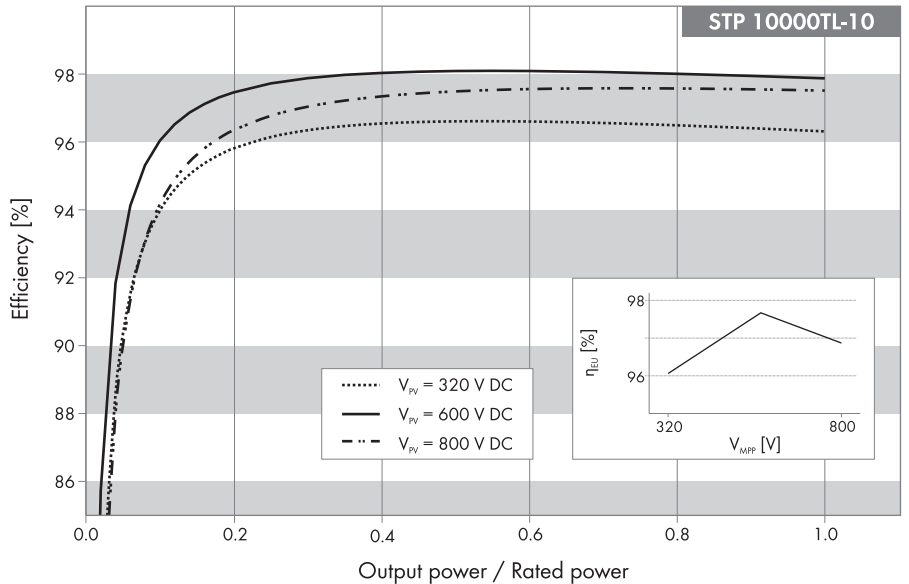
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 370 V | Rated input voltage 580 V | Maximum MPP voltage 800 V |
| 5% | 92.7% | 94.0% | 90.4% |
| 10% | 95.4% | 96.4% | 94.2% |
| 20% | 96.7% | 97.6% | 96.2% |
| 25% | 96.9% | 97.8% | 96.6% |
| 30% | 97.0% | 97.9% | 96.8% |
| 50% | 97.0% | 98.0% | 97.2% |
| 75% | 96.8% | 97.6% | 97.2% |
| 100% | 96.5% | 97.2% | 97.1% |

5.6.2 Derating Behavior



5.7 STP 10000TL-10

5.7.1 Efficiency

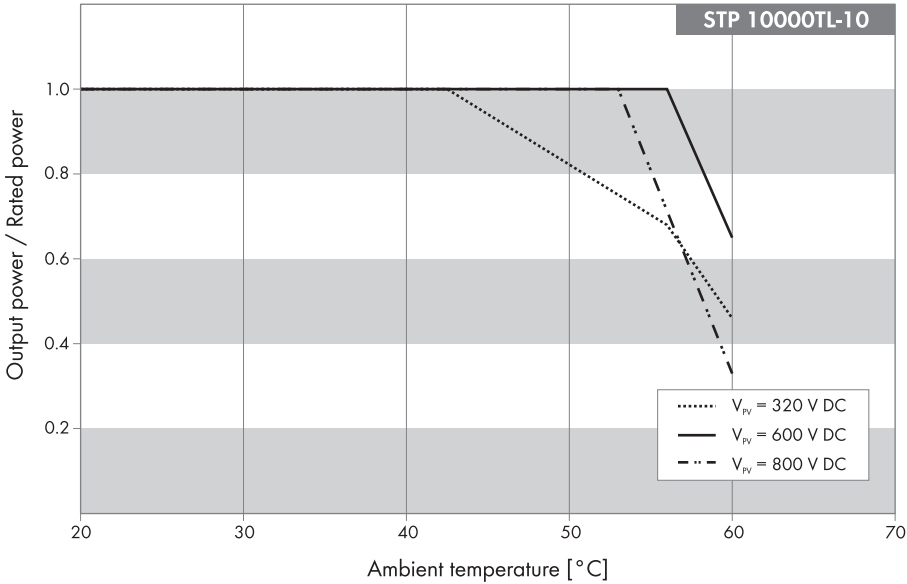


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 98.1% |
| European efficiency, η_{EU} | 97.7% |

Efficiency Profile

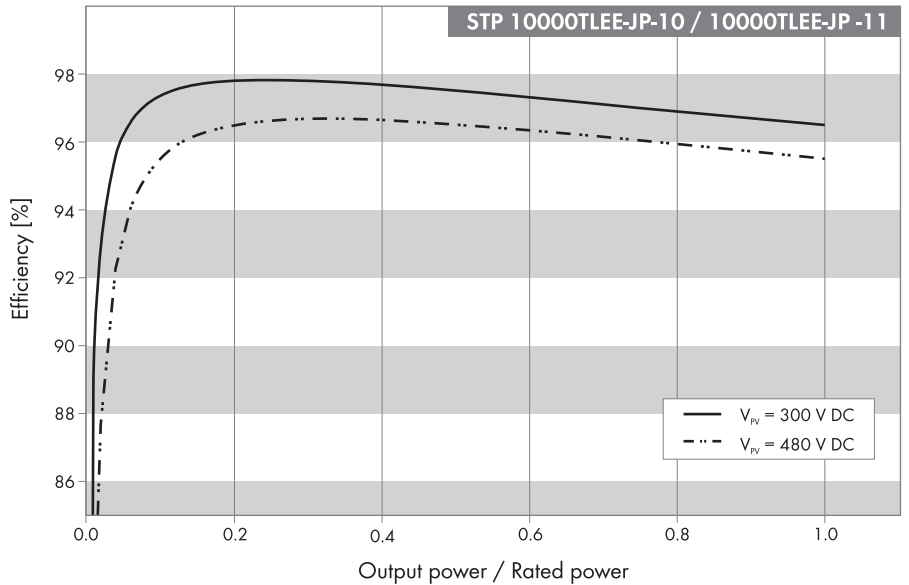
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 320 V | Rated input voltage 600 V | Maximum MPP voltage 800 V |
| 5% | 90.0% | 93.0% | 89.7% |
| 10% | 94.0% | 96.0% | 94.2% |
| 20% | 95.8% | 97.5% | 96.3% |
| 25% | 96.1% | 97.7% | 96.8% |
| 30% | 96.3% | 97.9% | 97.0% |
| 50% | 96.6% | 98.1% | 97.5% |
| 75% | 96.5% | 98.0% | 97.6% |
| 100% | 96.3% | 97.9% | 97.5% |

5.7.2 Derating Behavior



5.8 STP 10000TLEE-JP-10 / STP 10000TLEE-JP-11

5.8.1 Efficiency

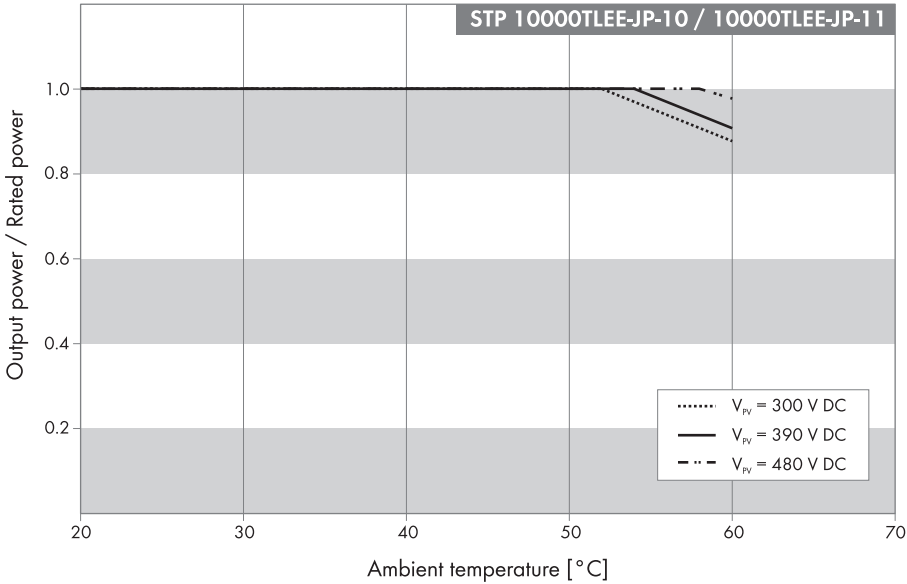


Maximum efficiency, η_{\max} 97.8%

Efficiency Profile

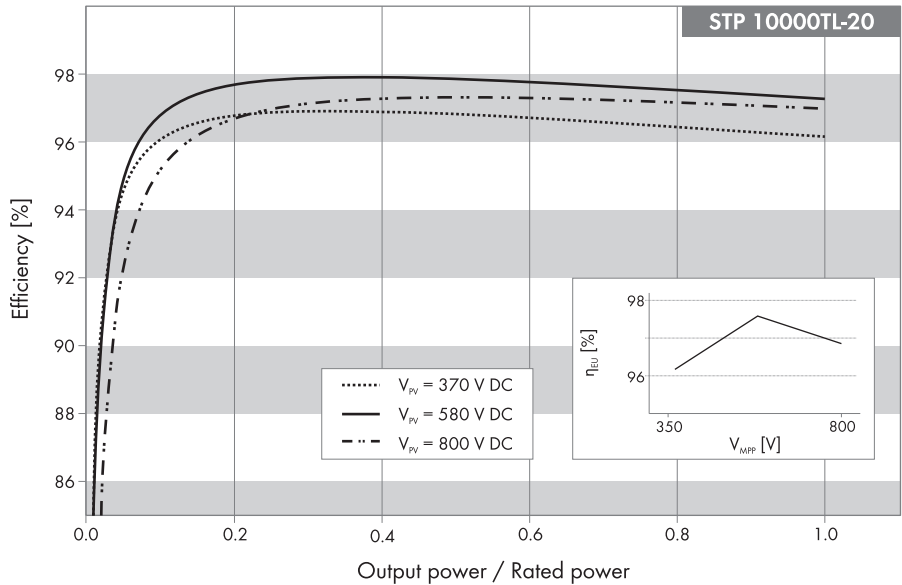
| Standardized output power | Efficiency | |
|---------------------------|---|------------------------------|
| | Minimum MPP voltage / rated input voltage 300 V | Maximum MPP voltage 480 V |
| 5% | 96.2% | 93.3% |
| 10% | 97.4% | 95.5% |
| 20% | 97.8% | 96.5% |
| 25% | 97.8% | 96.6% |
| 30% | 97.8% | 96.7% |
| 50% | 97.5% | 96.5% |
| 75% | 97.0% | 96.0% |
| 100% | 96.4% | 95.5% |

5.8.2 Derating Behavior



5.9 STP 10000TL-20

5.9.1 Efficiency



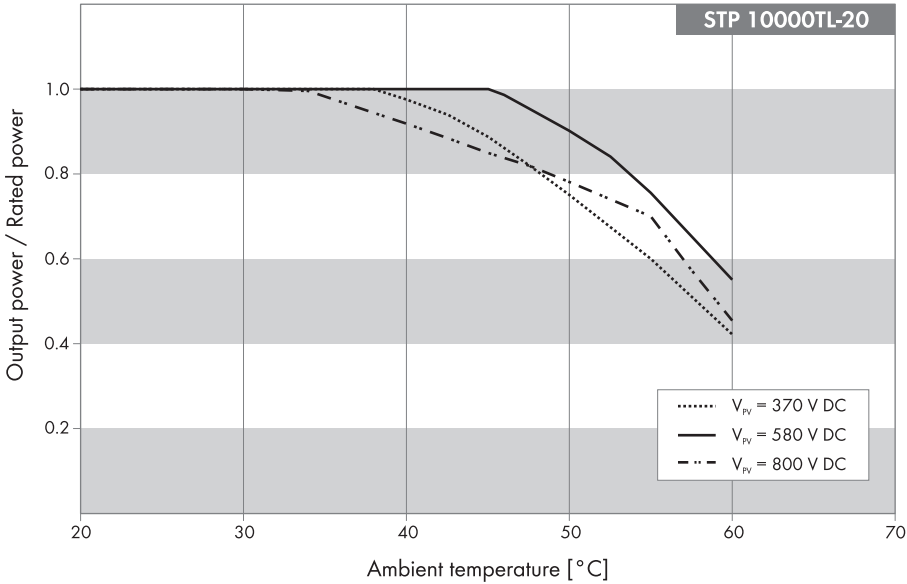
Maximum efficiency, η_{\max} 98.0%

European weighted efficiency, η_{EU} 97.6%

Efficiency Profile

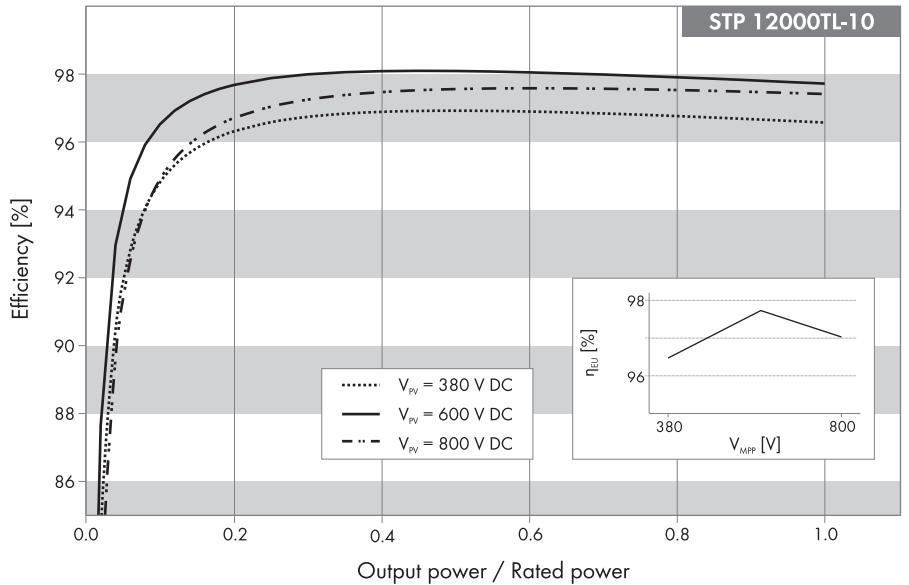
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 370 V | Rated input voltage 580 V | Maximum MPP voltage 800 V |
| 5% | 94.5% | 94.9% | 92.2% |
| 10% | 96.1% | 96.8% | 95.2% |
| 20% | 96.8% | 97.7% | 96.7% |
| 25% | 96.9% | 97.8% | 97.0% |
| 30% | 96.9% | 97.9% | 97.1% |
| 50% | 96.8% | 97.9% | 97.3% |
| 75% | 96.5% | 97.6% | 97.2% |
| 100% | 96.2% | 97.3% | 97.0% |

5.9.2 Derating Behavior



5.10 STP 12000TL-10

5.10.1 Efficiency

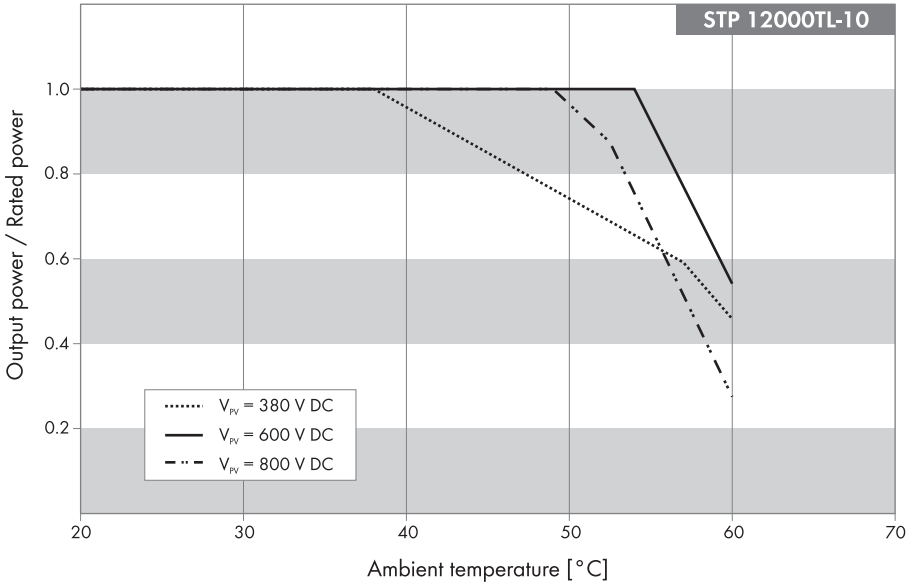


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 98.1% |
| European efficiency, η_{EU} | 97.7% |

Efficiency Profile

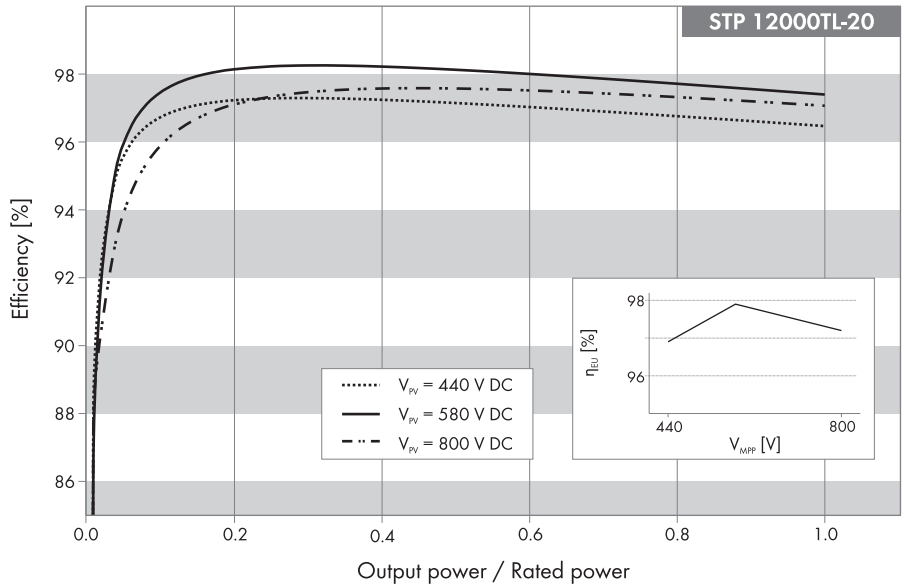
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 380 V | Rated input voltage 600 V | Maximum MPP voltage 800 V |
| 5% | 91.6% | 93.9% | 91.1% |
| 10% | 94.8% | 96.5% | 94.9% |
| 20% | 96.3% | 97.7% | 96.7% |
| 25% | 96.6% | 97.9% | 97.0% |
| 30% | 96.7% | 98.0% | 97.2% |
| 50% | 96.9% | 98.1% | 97.6% |
| 75% | 96.8% | 97.9% | 97.6% |
| 100% | 96.6% | 97.7% | 97.4% |

5.10.2 Derating Behavior



5.11 STP 12000TL-20

5.11.1 Efficiency

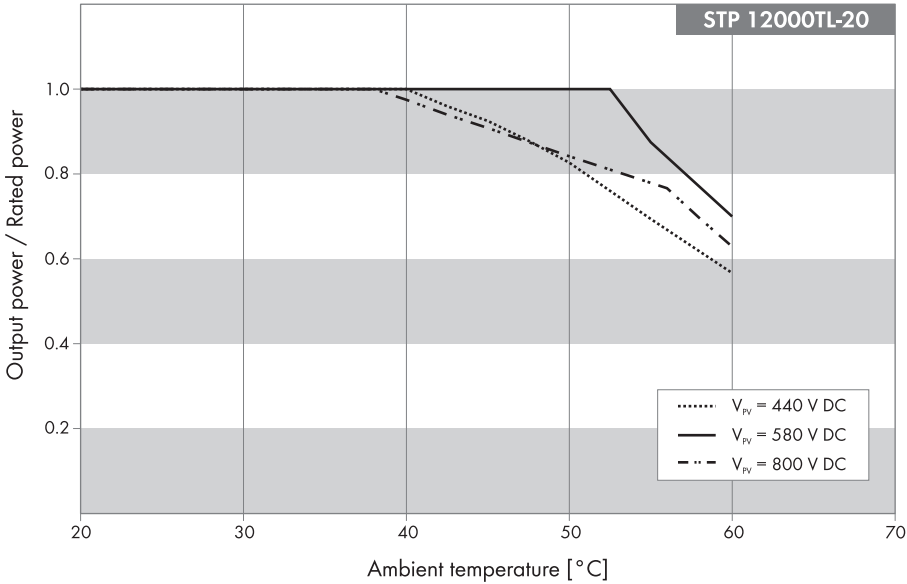


| | |
|-----------------------------------|-------|
| Maximum efficiency, η_{\max} | 98.3% |
| European efficiency, η_{EU} | 97.9% |

Efficiency Profile

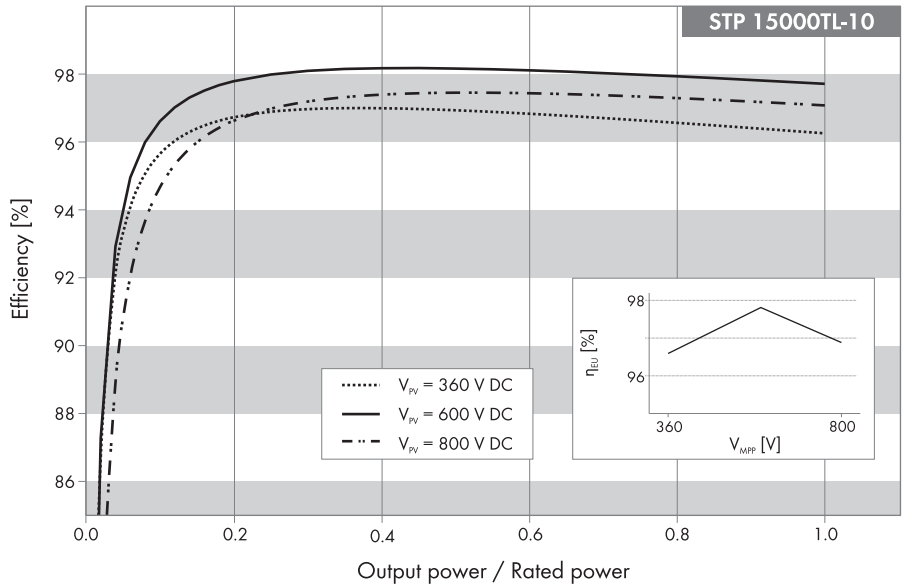
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 440 V | Rated input voltage 580 V | Maximum MPP voltage 800 V |
| 5% | 95.5% | 95.9% | 93.8% |
| 10% | 96.7% | 97.4% | 95.9% |
| 20% | 97.2% | 98.1% | 97.1% |
| 25% | 97.3% | 98.2% | 97.3% |
| 30% | 97.3% | 98.3% | 97.6% |
| 50% | 97.1% | 98.1% | 97.6% |
| 75% | 96.8% | 97.8% | 97.4% |
| 100% | 96.5% | 97.4% | 97.1% |

5.11.2 Derating Behavior



5.12 STP 15000TL-10

5.12.1 Efficiency

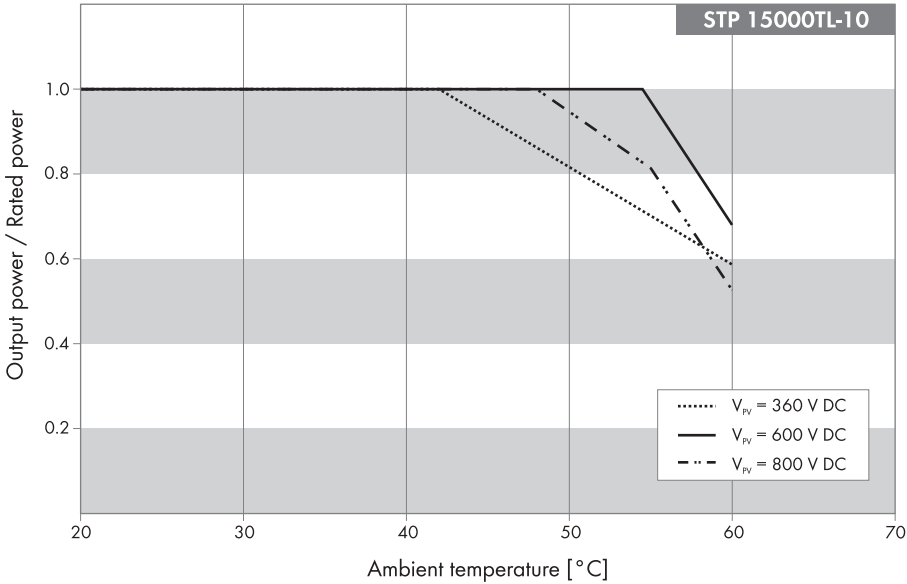


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 98.2% |
| European efficiency, η_{EU} | 97.8% |

Efficiency Profile

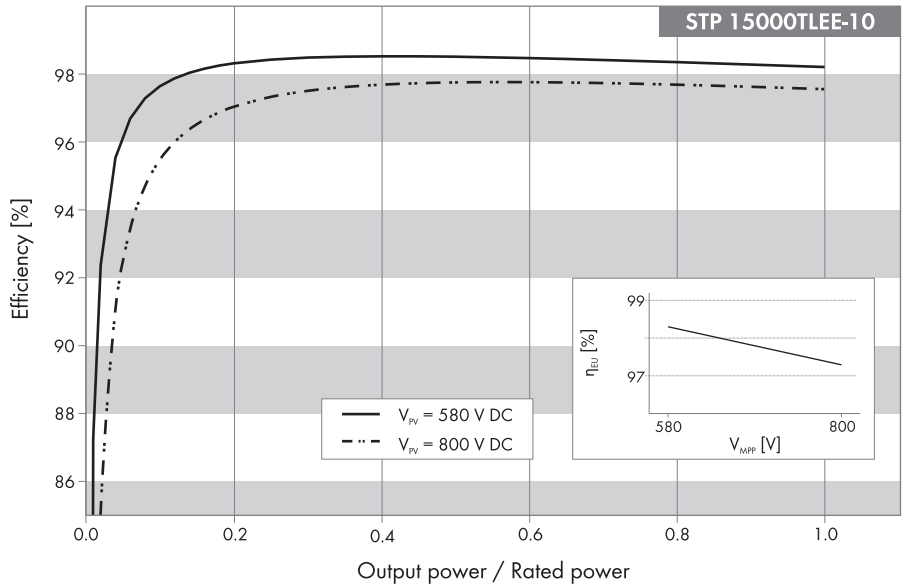
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 360 V | Rated input voltage 600 V | Maximum MPP voltage 800 V |
| 5% | 93.1% | 93.9% | 90.5% |
| 10% | 95.7% | 96.6% | 94.7% |
| 20% | 96.7% | 97.8% | 96.6% |
| 25% | 96.9% | 98.0% | 97.0% |
| 30% | 97.0% | 98.1% | 97.2% |
| 50% | 96.9% | 98.2% | 97.5% |
| 75% | 96.6% | 98.0% | 97.3% |
| 100% | 96.3% | 97.7% | 97.1% |

5.12.2 Derating Behavior



5.13 STP 15000TLEE-10

5.13.1 Efficiency

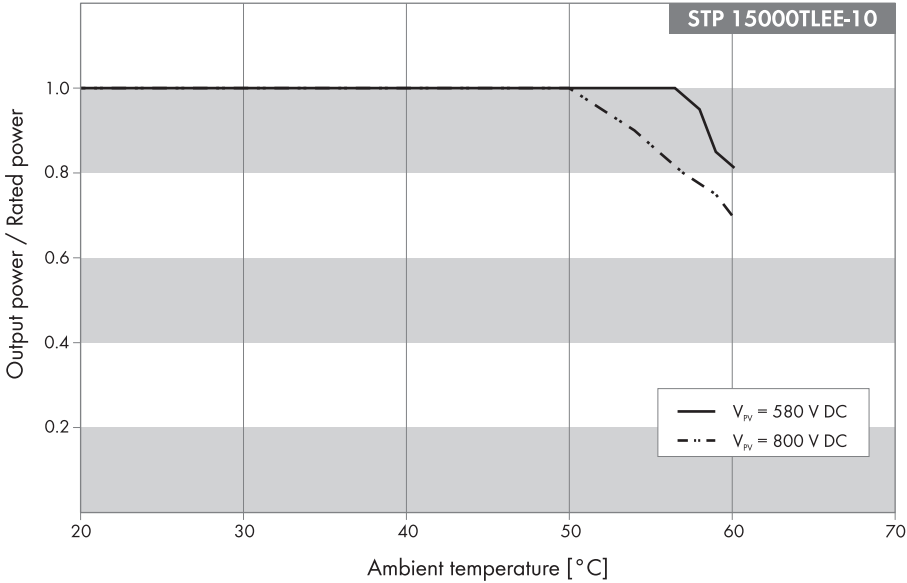


| | |
|-----------------------------------|-------|
| Maximum efficiency, η_{\max} | 98.5% |
| European efficiency, η_{EU} | 98.3% |

Efficiency Profile

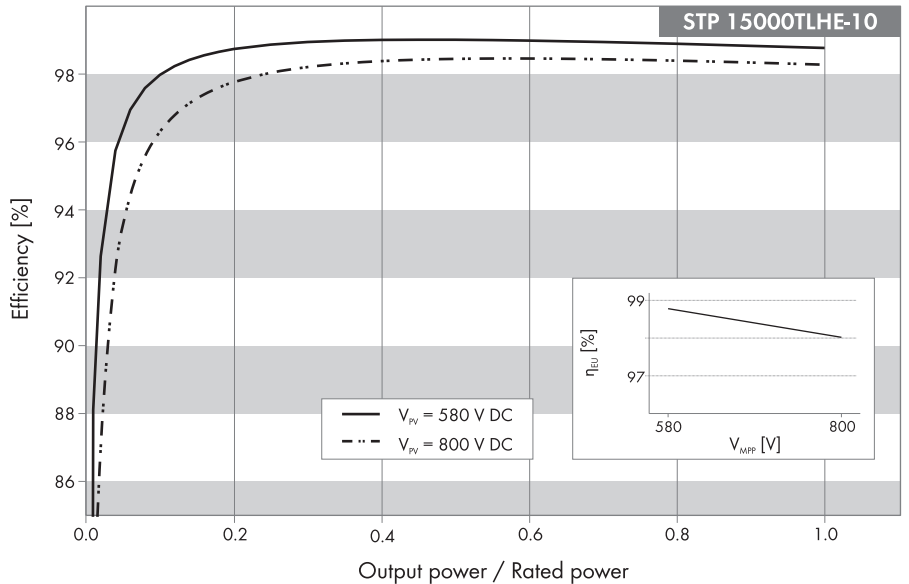
| Standardized output power | Efficiency | |
|---------------------------|---|------------------------------|
| | Minimum MPP voltage / rated input voltage 580 V | Maximum MPP voltage 800 V |
| 5% | 96.1% | 92.2% |
| 10% | 97.6% | 95.5% |
| 20% | 98.3% | 97.0% |
| 25% | 98.4% | 97.3% |
| 30% | 98.5% | 97.5% |
| 50% | 98.5% | 97.8% |
| 75% | 98.4% | 97.7% |
| 100% | 98.2% | 97.6% |

5.13.2 Derating Behavior



5.14 STP 15000TLHE-10

5.14.1 Efficiency

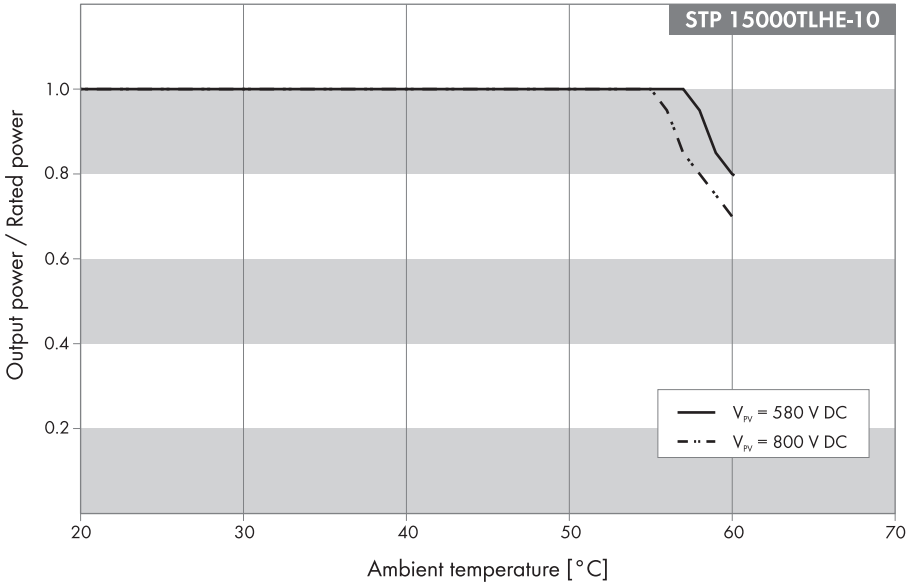


| | |
|---|-------|
| Maximum efficiency, η_{\max} | 99.0% |
| European efficiency, η_{EU} | 98.7% |

Efficiency Profile

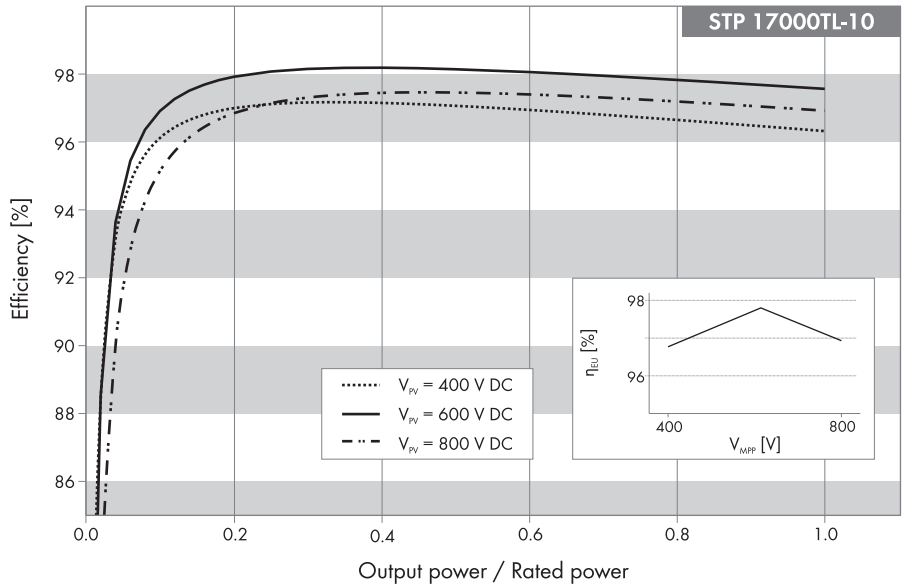
| Standardized output power | Efficiency | |
|---------------------------|---|------------------------------|
| | Minimum MPP voltage / rated input voltage 580 V | Maximum MPP voltage 800 V |
| 5% | 96.4% | 93.3% |
| 10% | 98.0% | 96.3% |
| 20% | 98.7% | 97.8% |
| 25% | 98.9% | 98.0% |
| 30% | 98.9% | 98.2% |
| 50% | 99.0% | 98.5% |
| 75% | 98.9% | 98.4% |
| 100% | 98.8% | 98.3% |

5.14.2 Derating Behavior



5.15 STP 17000TL-10

5.15.1 Efficiency

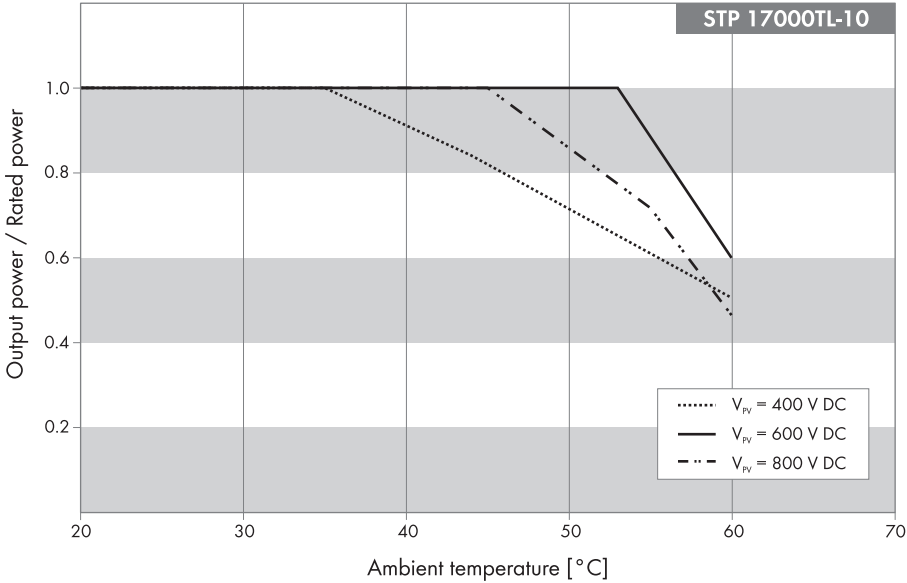


| | |
|---|-------|
| Maximum efficiency, η_{\max} | 98.2% |
| European efficiency, η_{EU} | 97.8% |

Efficiency Profile

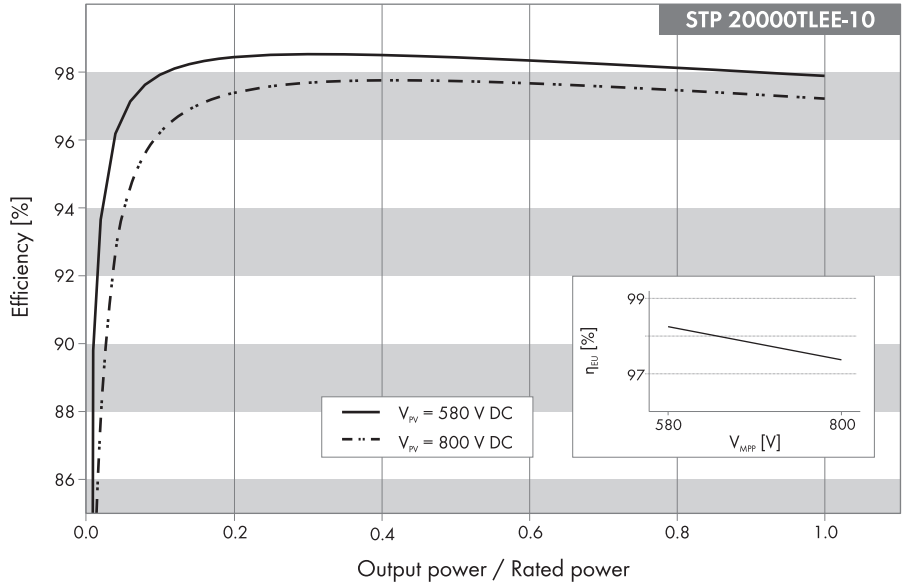
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 400 V | Rated input voltage 600 V | Maximum MPP voltage 800 V |
| 5% | 94.0% | 94.5% | 91.4% |
| 10% | 96.1% | 96.9% | 95.1% |
| 20% | 97.0% | 97.9% | 96.8% |
| 25% | 97.1% | 98.1% | 97.1% |
| 30% | 97.2% | 98.2% | 97.3% |
| 50% | 97.1% | 98.1% | 97.5% |
| 75% | 96.7% | 97.9% | 97.3% |
| 100% | 96.3% | 97.6% | 96.9% |

5.15.2 Derating Behavior



5.16 STP 20000TLEE-10

5.16.1 Efficiency

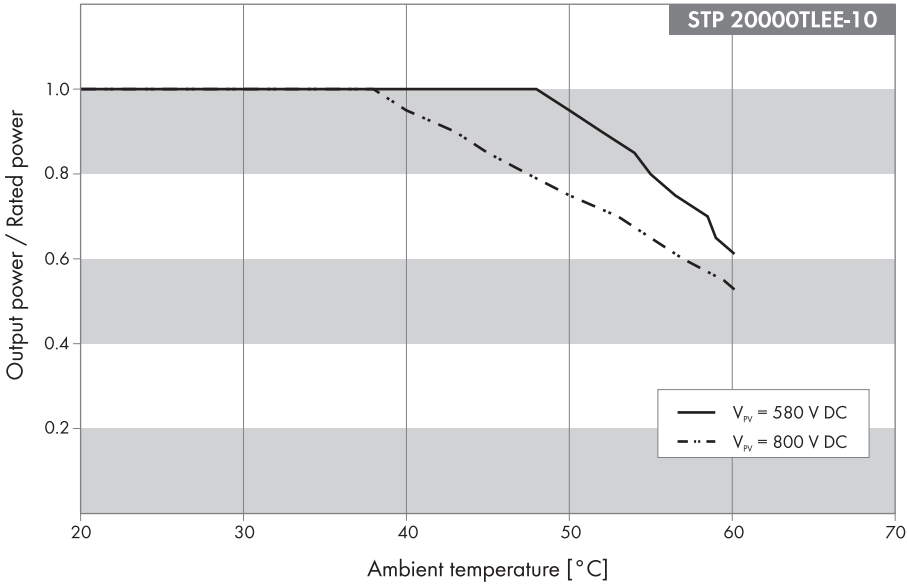


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 98.5% |
| European efficiency, η_{EU} | 98.2% |

Efficiency Profile

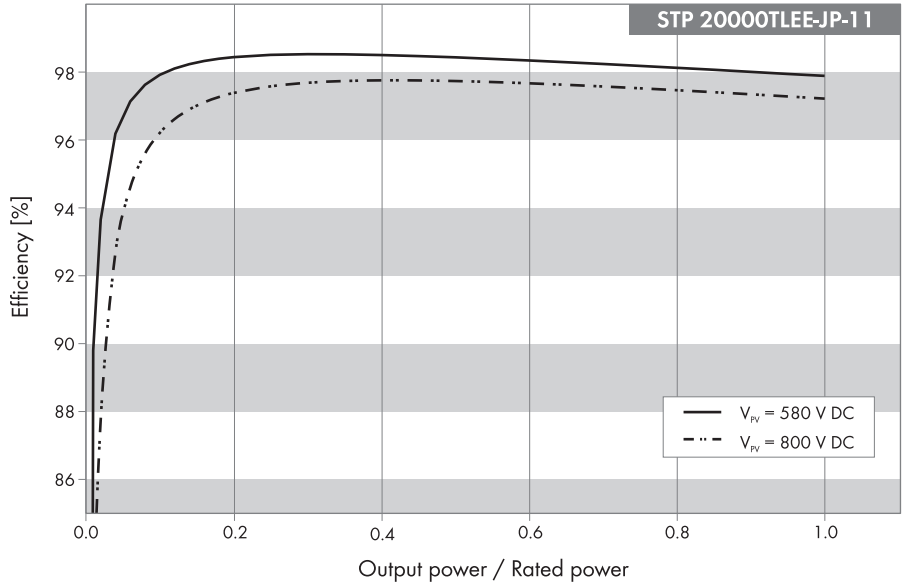
| Standardized output power | Efficiency | |
|---------------------------|---|------------------------------|
| | Minimum MPP voltage / rated input voltage 580 V | Maximum MPP voltage 800 V |
| 5% | 96.7% | 93.6% |
| 10% | 97.9% | 96.2% |
| 20% | 98.4% | 97.4% |
| 25% | 98.5% | 97.6% |
| 30% | 98.5% | 97.7% |
| 50% | 98.4% | 97.7% |
| 75% | 98.2% | 97.5% |
| 100% | 97.9% | 97.2% |

5.16.2 Derating Behavior



5.17 STP 20000TLEE-JP-11

5.17.1 Efficiency

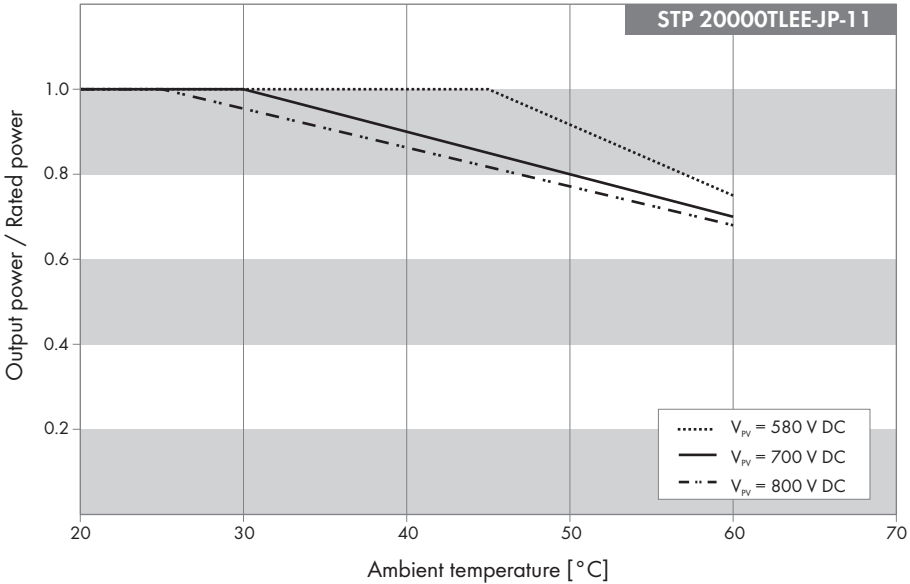


Maximum efficiency, η_{\max} 98.5%

Efficiency Profile

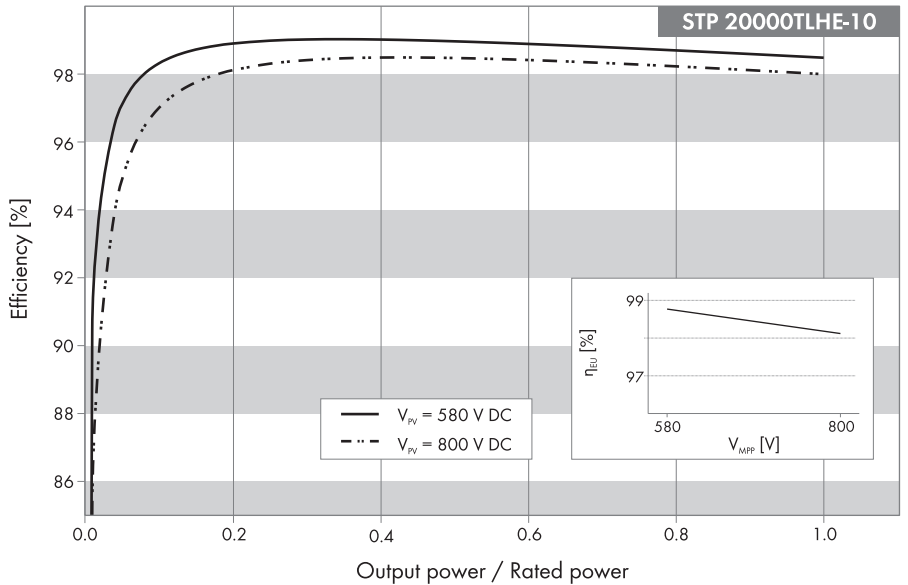
| Standardized output power | Efficiency | |
|---------------------------|---|------------------------------|
| | Minimum MPP voltage / rated input voltage 580 V | Maximum MPP voltage 800 V |
| 5% | 96.7% | 93.6% |
| 10% | 97.9% | 96.2% |
| 20% | 98.4% | 97.4% |
| 25% | 98.5% | 97.6% |
| 30% | 98.5% | 97.7% |
| 50% | 98.4% | 97.7% |
| 75% | 98.2% | 97.5% |
| 100% | 97.9% | 97.2% |

5.17.2 Derating Behavior



5.18 STP 20000TLHE-10

5.18.1 Efficiency

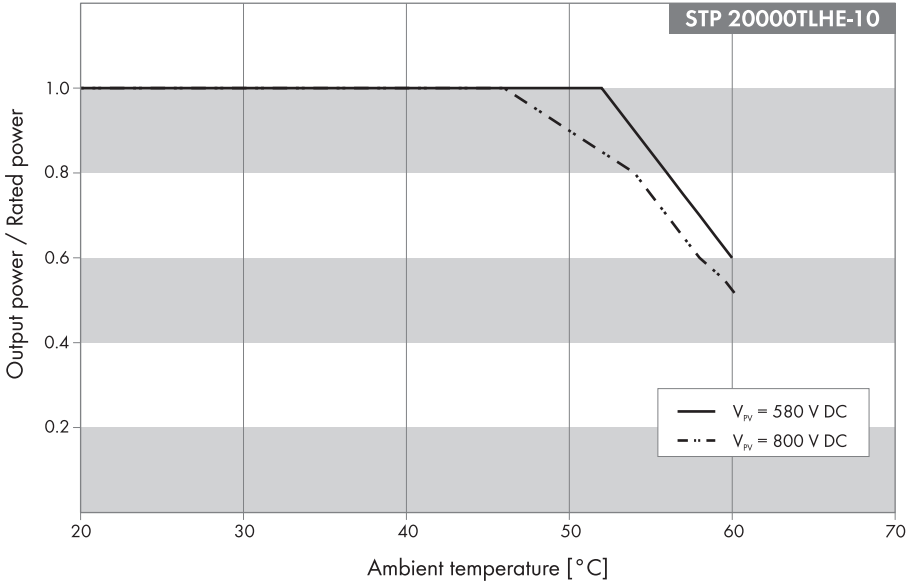


| | |
|---|-------|
| Maximum efficiency, η_{max} | 99.0% |
| European weighted efficiency, η_{EU} | 98.7% |

Efficiency Profile

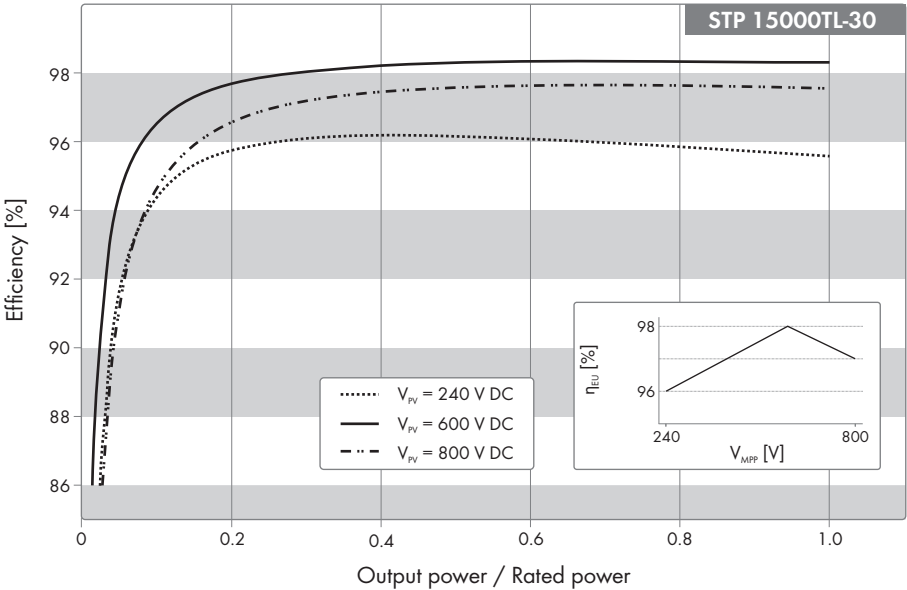
| Standardized output power | Efficiency | |
|---------------------------|---|------------------------------|
| | Minimum MPP voltage / rated input voltage 580 V | Maximum MPP voltage 800 V |
| 5% | 97.0% | 94.7% |
| 10% | 98.3% | 97.0% |
| 20% | 98.9% | 98.1% |
| 25% | 99.0% | 98.3% |
| 30% | 99.0% | 98.4% |
| 50% | 99.0% | 98.5% |
| 75% | 98.8% | 98.3% |
| 100% | 98.5% | 98.0% |

5.18.2 Derating Behavior



5.19 STP 15000TL-30

5.19.1 Efficiency



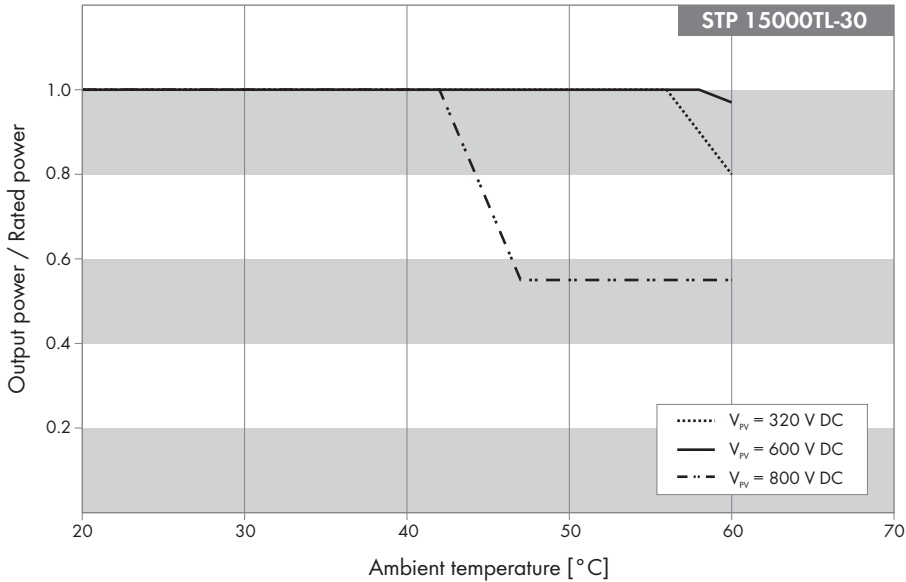
Maximum efficiency, η_{max} 98.3 %

European weighted efficiency, η_{EU} 98.0 %

Efficiency Profile

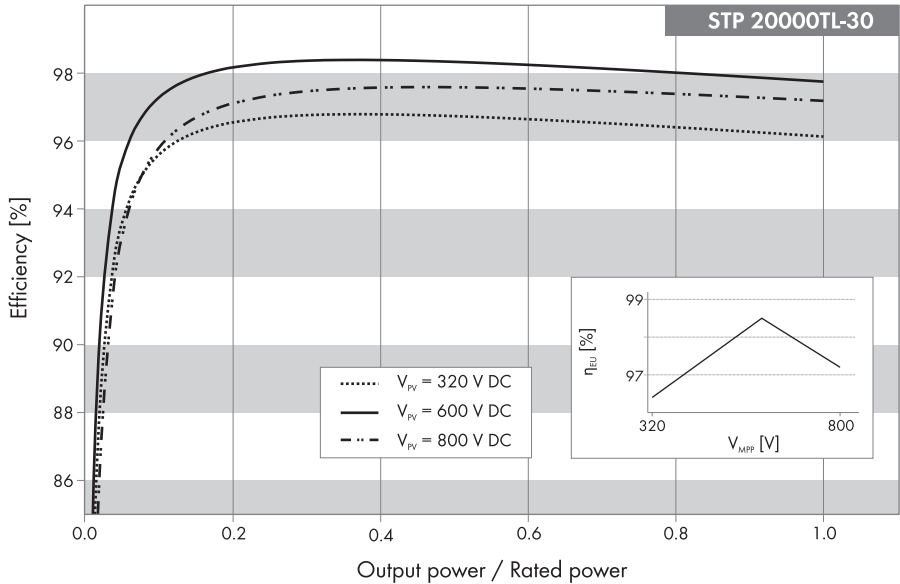
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 240 V | Rated input voltage 600 V | Maximum MPP voltage 800 V |
| 5 % | 91.4 % | 94.3 % | 90.9 % |
| 10 % | 94.4 % | 96.5 % | 94.6 % |
| 20 % | 95.7 % | 97.7 % | 96.6 % |
| 25 % | 96.0 % | 97.9 % | 96.9 % |
| 30 % | 96.1 % | 98.0 % | 97.2 % |
| 50 % | 96.2 % | 98.3 % | 97.6 % |
| 75 % | 95.9 % | 98.3 % | 97.6 % |
| 100 % | 95.6 % | 98.3 % | 97.5 % |

5.19.2 Derating Behavior



5.20 STP 20000TL-30

5.20.1 Efficiency



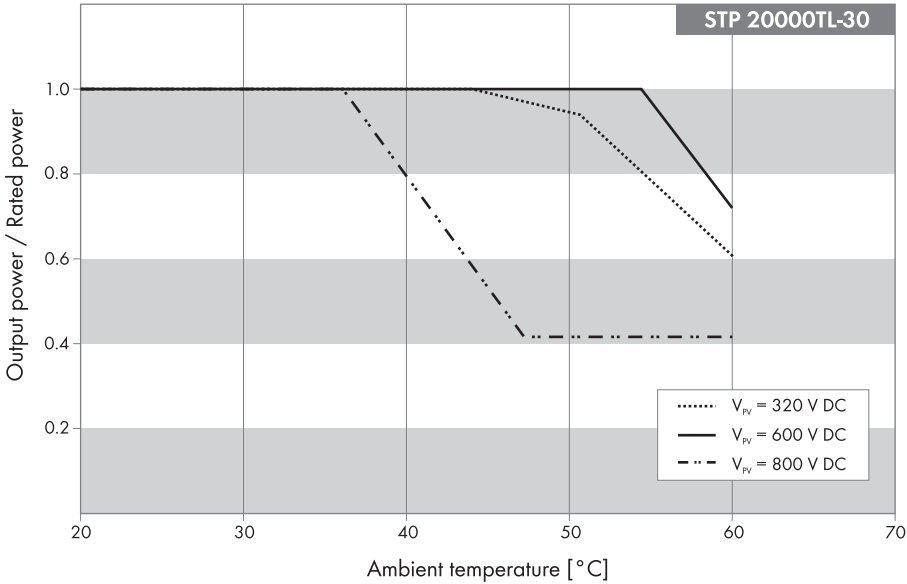
Maximum efficiency, η_{max} 98.4%

European weighted efficiency, η_{EU} 98.0%

Efficiency Profile

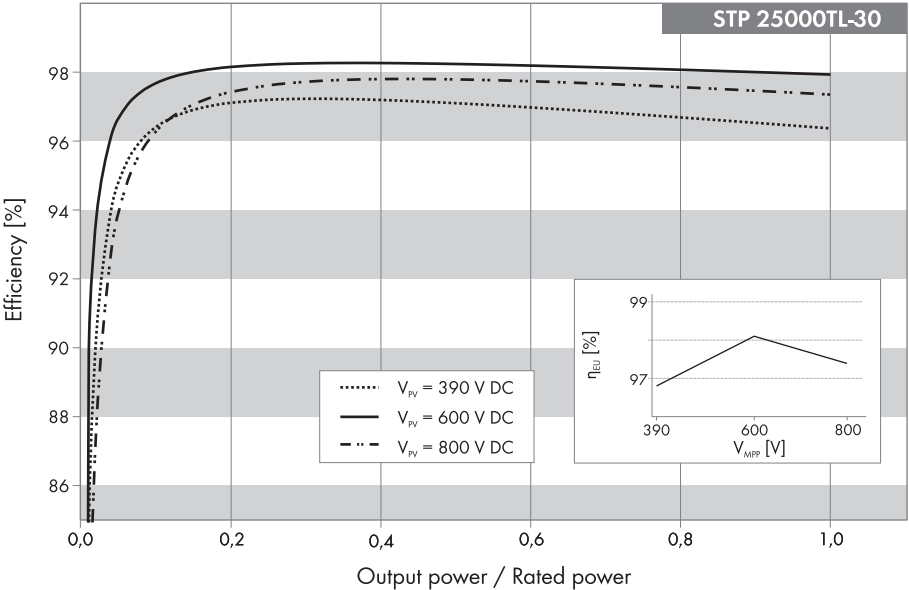
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 320 V | Rated input voltage 600 V | Maximum MPP voltage 800 V |
| 5% | 93.5% | 95.3% | 93.1% |
| 10% | 95.6% | 97.3% | 95.8% |
| 20% | 96.5% | 98.2% | 97.1% |
| 25% | 96.7% | 98.3% | 97.3% |
| 30% | 96.8% | 98.4% | 97.5% |
| 50% | 96.7% | 98.3% | 97.6% |
| 75% | 96.5% | 98.1% | 97.4% |
| 100% | 96.1% | 97.7% | 97.2% |

5.20.2 Derating Behavior



5.21 STP 25000TL-30

5.21.1 Efficiency



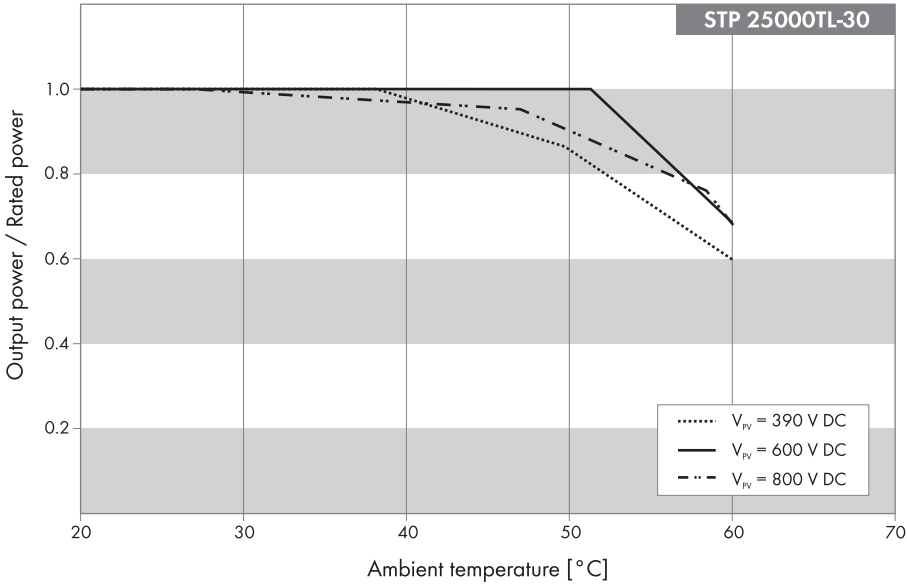
Maximum efficiency, η_{max} 98.3%

European weighted efficiency, η_{EU} 98.1%

Efficiency Profile

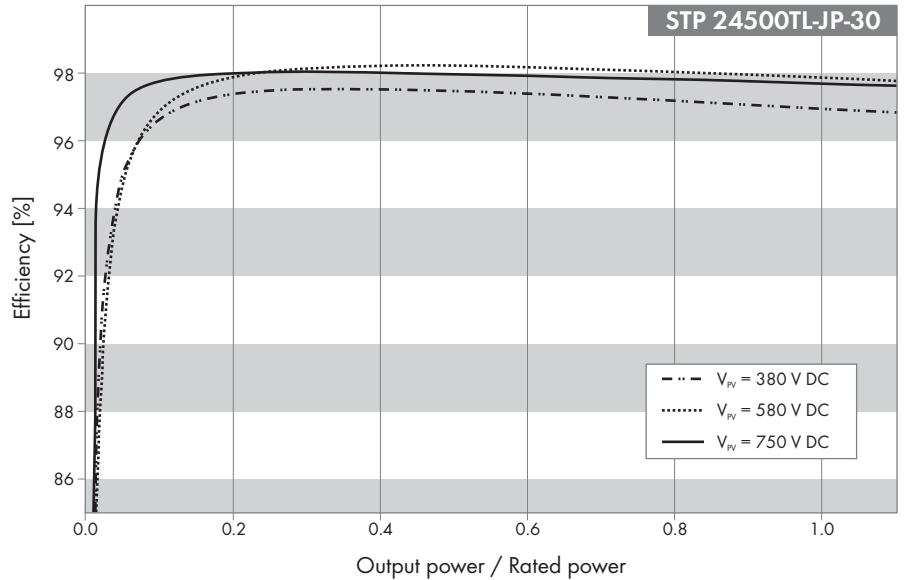
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 390 V | Rated input voltage 600 V | Maximum MPP voltage 800 V |
| 5% | 94.8% | 96.7% | 93.9% |
| 10% | 96.4% | 97.7% | 96.3% |
| 20% | 97.1% | 98.2% | 97.4% |
| 25% | 97.2% | 98.2% | 97.6% |
| 30% | 97.2% | 98.3% | 97.7% |
| 50% | 97.1% | 98.2% | 97.8% |
| 75% | 96.8% | 98.1% | 97.6% |
| 100% | 96.4% | 97.9% | 97.4% |

5.21.2 Derating Behavior



5.22
STP 24500TL-JP-30

5.22.1
Efficiency

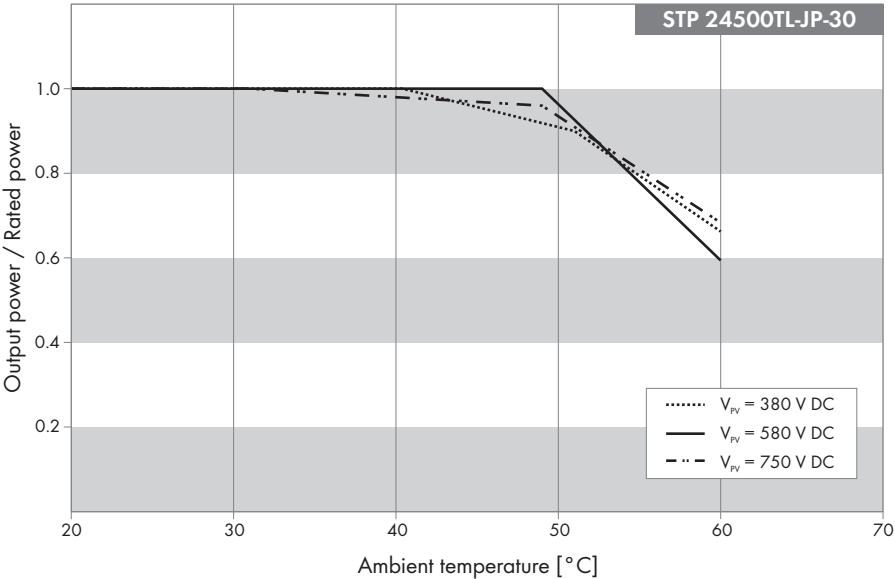


| | |
|--|-------|
| Maximum efficiency, η_{max} | 98.8% |
| European weighted efficiency, η_{EU} | 98.0% |

Efficiency Profile

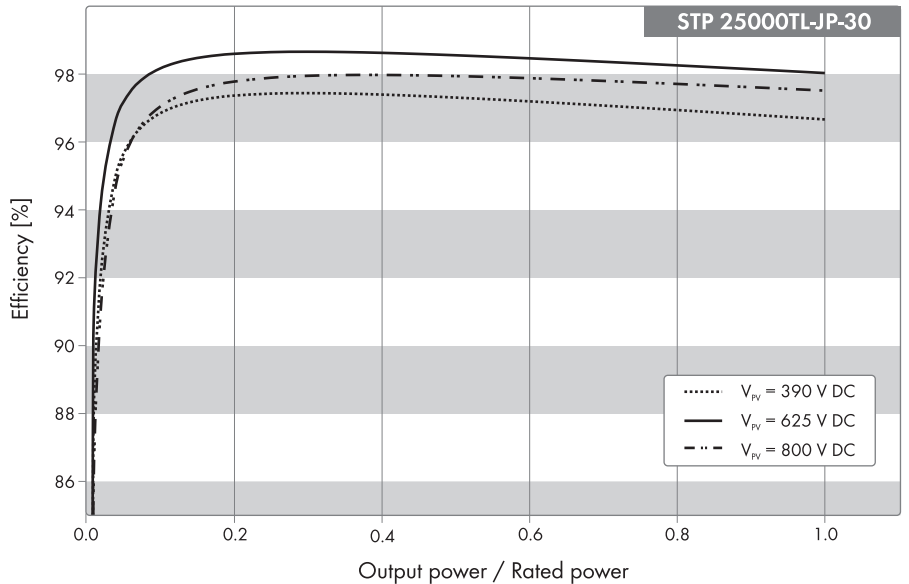
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 380 V | Rated input voltage 580 V | Maximum MPP voltage 750 V |
| 5% | 95.2% | 97.2% | 95.1% |
| 10% | 96.7% | 97.8% | 97.0% |
| 20% | 97.3% | 98.0% | 97.9% |
| 25% | 97.4% | 98.0% | 98.1% |
| 30% | 97.4% | 98.0% | 98.1% |
| 50% | 97.3% | 97.9% | 98.2% |
| 75% | 97.0% | 97.7% | 98.0% |
| 100% | 96.7% | 97.5% | 97.7% |

5.22.2 Derating Behavior



5.23 STP 25000TL-JP-30

5.23.1 Efficiency

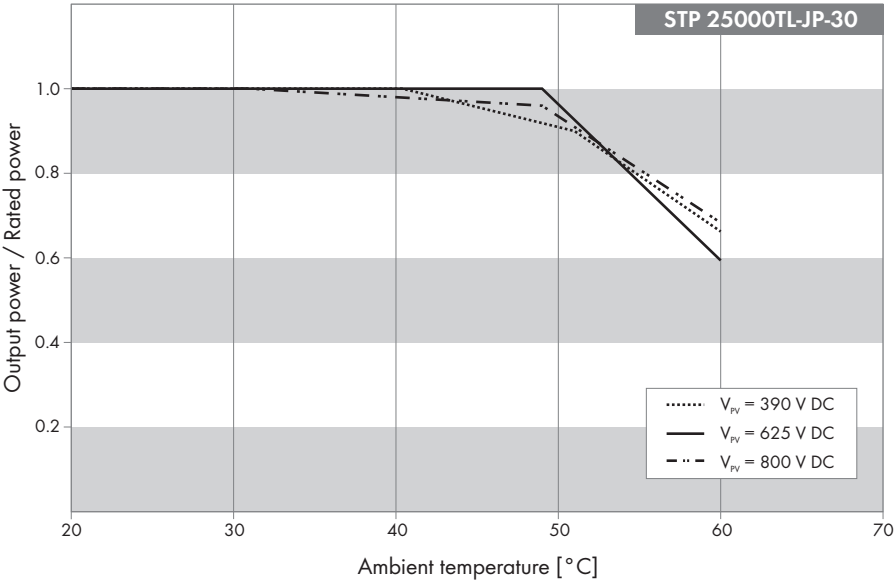


| | |
|--|-------|
| Maximum efficiency, η_{max} | 98.7% |
| European weighted efficiency, η_{EU} | 98.4% |

Efficiency Profile

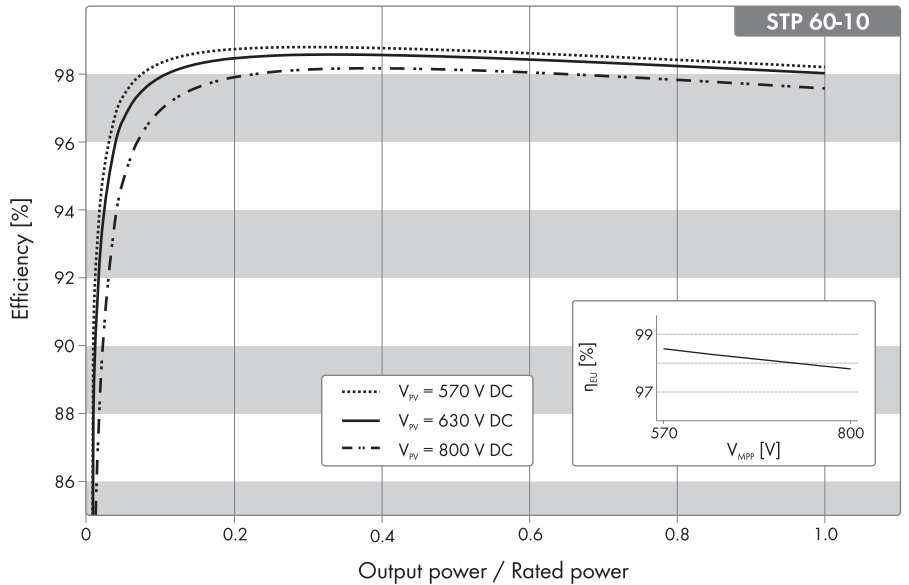
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 390 V | Rated input voltage 625 V | Maximum MPP voltage 800 V |
| 5% | 95.6% | 97.1% | 95.4% |
| 10% | 96.8% | 98.2% | 97.0% |
| 20% | 97.4% | 98.6% | 97.8% |
| 25% | 97.4% | 98.6% | 97.9% |
| 30% | 97.4% | 98.7% | 98.0% |
| 50% | 97.3% | 98.6% | 97.9% |
| 75% | 97.0% | 98.3% | 97.8% |
| 100% | 96.7% | 98.0% | 97.5% |

5.23.2 Derating Behavior



5.24 STP 60-10

5.24.1 Efficiency

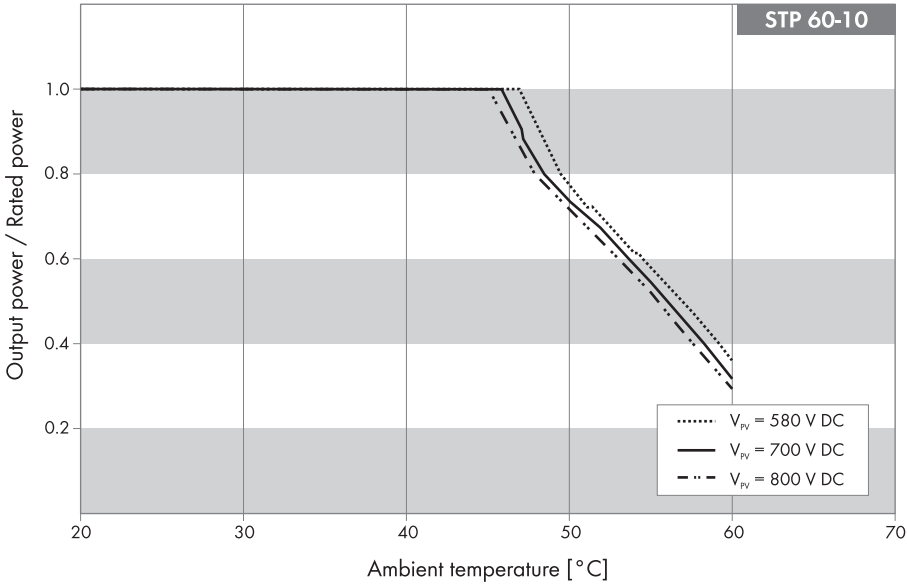


| | |
|---|--------|
| Maximum efficiency, η_{max} | 98.8 % |
| European weighted efficiency, η_{EU} | 98.3 % |

Efficiency Profile

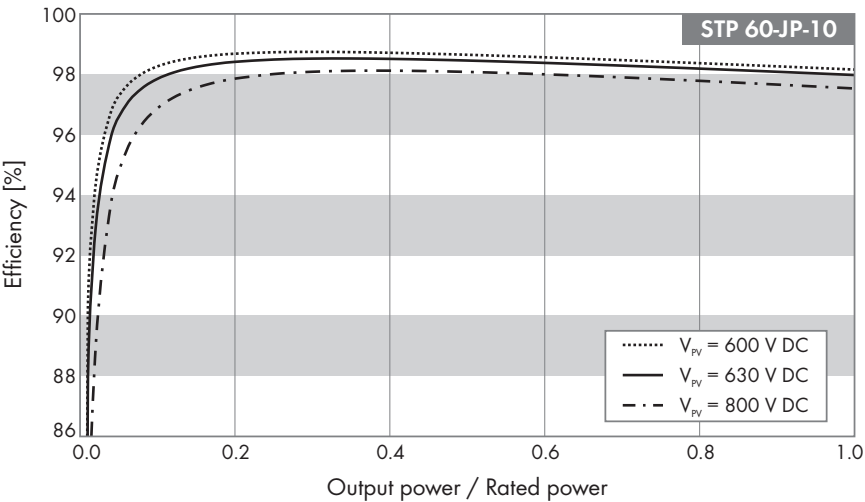
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 570 V | Rated input voltage 630 V | Maximum MPP voltage 800 V |
| 5 % | 97.3 % | 96.5 % | 94.6 % |
| 10 % | 98.2 % | 97.8 % | 96.9 % |
| 20 % | 98.7 % | 98.4 % | 97.9 % |
| 25 % | 98.8 % | 98.5 % | 98.0 % |
| 30 % | 98.8 % | 98.5 % | 98.1 % |
| 50 % | 98.6 % | 98.5 % | 98.0 % |
| 75 % | 98.4 % | 98.2 % | 97.8 % |
| 100 % | 98.2 % | 98.0 % | 97.6 % |

5.24.2 Derating Behavior



5.25 STP 60-JP-10

5.25.1 Efficiency

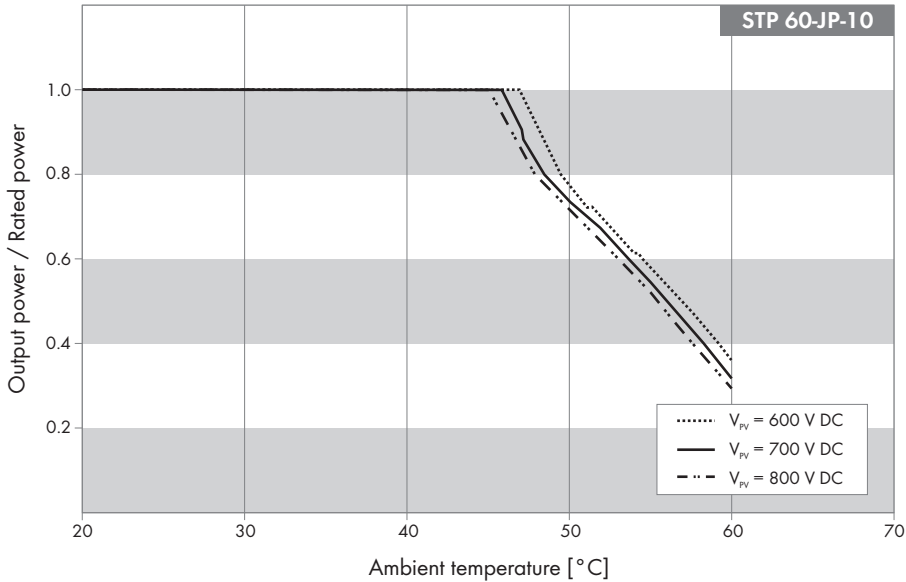


| | |
|--|-------|
| Maximum efficiency, η_{\max} | 98.8% |
| European weighted efficiency, η_{EU} | 98.3% |

Efficiency Profile

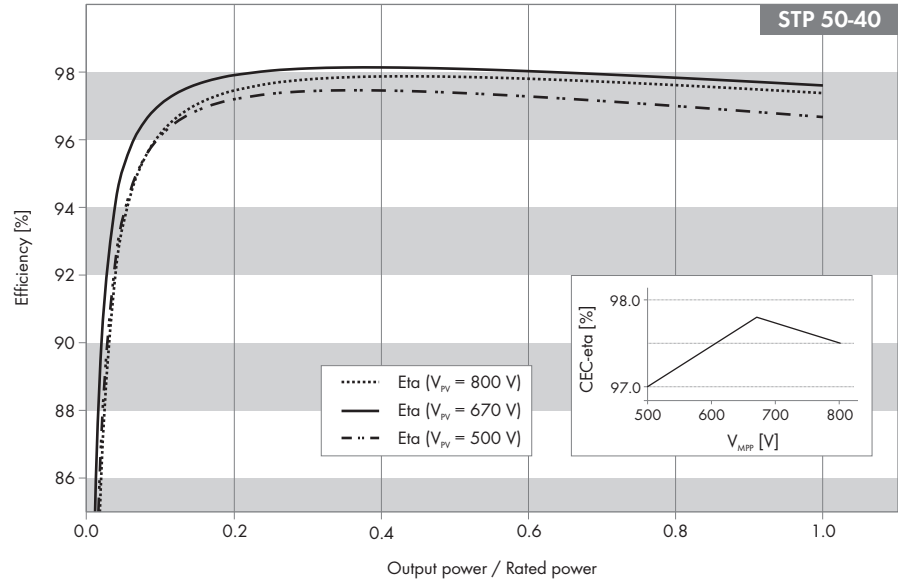
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 600 V | Rated input voltage 630 V | Maximum MPP voltage 800 V |
| 5% | 96.6% | 96.5% | 94.6% |
| 10% | 98.0% | 97.8% | 96.9% |
| 20% | 98.6% | 98.4% | 97.9% |
| 25% | 98.7% | 98.5% | 98.0% |
| 30% | 98.7% | 98.5% | 98.1% |
| 50% | 98.6% | 98.5% | 98.0% |
| 75% | 98.3% | 98.2% | 97.8% |
| 100% | 98.1% | 98.0% | 97.6% |

5.25.2 Derating Behavior



5.26 STP 50-40

5.26.1 Efficiency



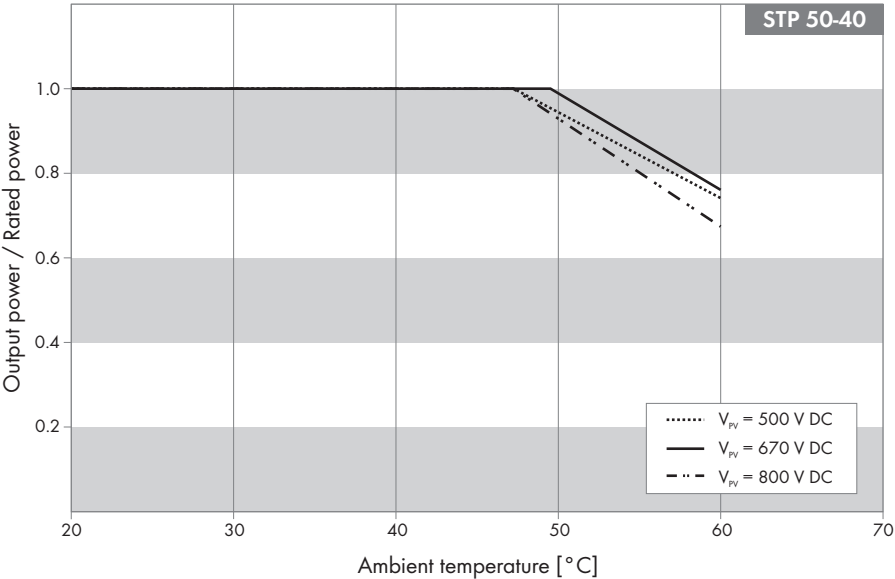
Maximum efficiency, η_{\max} 98.1%

European weighted efficiency, η_{EU} 97.8%

Efficiency Profile

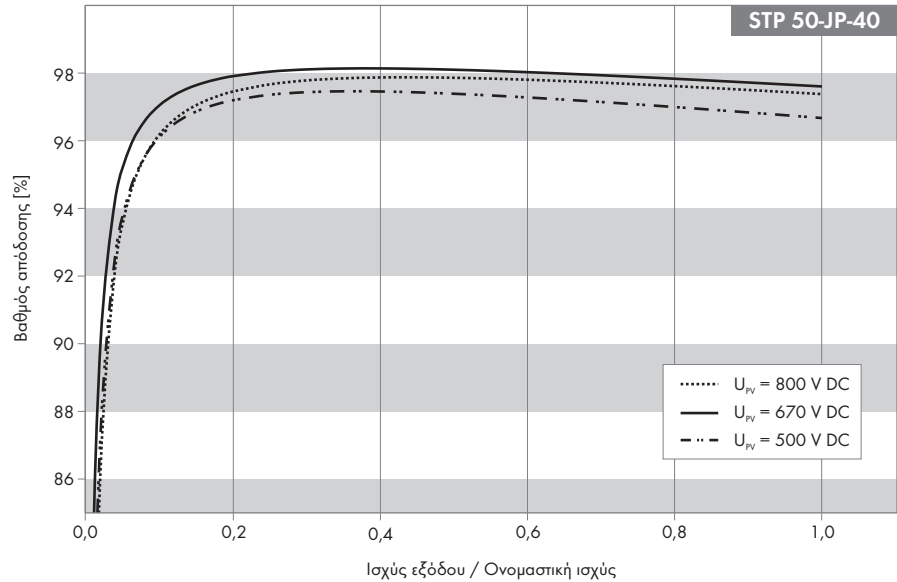
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 500 V | Rated input voltage 670 V | Maximum MPP voltage 800 V |
| 5% | 93.7% | 95.2% | 93.5% |
| 10% | 96.1% | 97.0% | 96.2% |
| 20% | 97.2% | 97.9% | 97.4% |
| 25% | 97.3% | 98.0% | 97.6% |
| 30% | 97.4% | 98.1% | 97.8% |
| 50% | 97.4% | 98.1% | 97.8% |
| 75% | 97.1% | 97.9% | 97.6% |
| 100% | 96.7% | 97.6% | 97.4% |

5.26.2 Derating Behavior



5.27 STP 50-JP-40

5.27.1 Efficiency



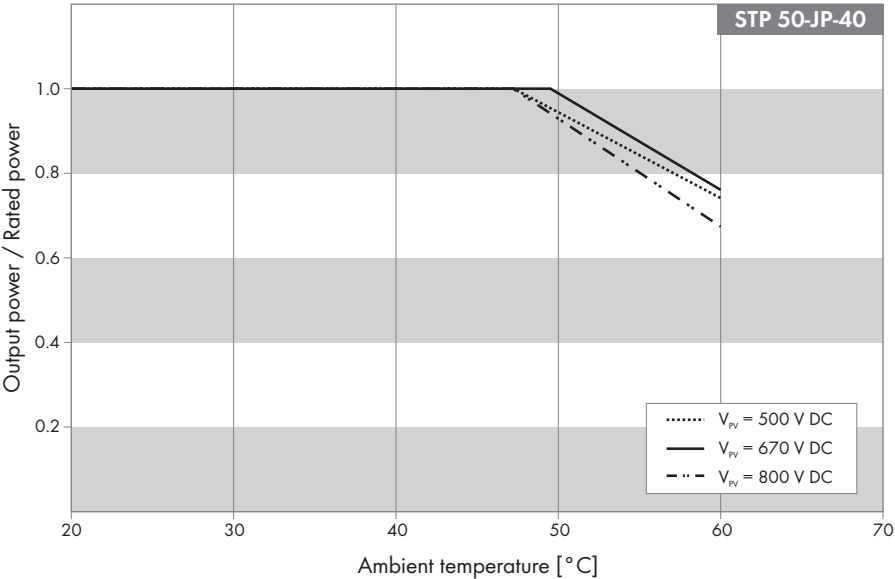
Maximum efficiency, η_{\max} 98.1 %

European weighted efficiency, η_{EU} 97.8 %

Efficiency Profile

| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 500 V | Rated input voltage 670 V | Maximum MPP voltage 800 V |
| 5 % | 93.7 % | 95.2 % | 93.5 % |
| 10 % | 96.1 % | 97.0 % | 96.2 % |
| 20 % | 97.2 % | 97.9 % | 97.4 % |
| 25 % | 97.3 % | 98.0 % | 97.6 % |
| 30 % | 97.4 % | 98.1 % | 97.8 % |
| 50 % | 97.4 % | 98.1 % | 97.8 % |
| 75 % | 97.1 % | 97.9 % | 97.6 % |
| 100 % | 96.7 % | 97.6 % | 97.4 % |

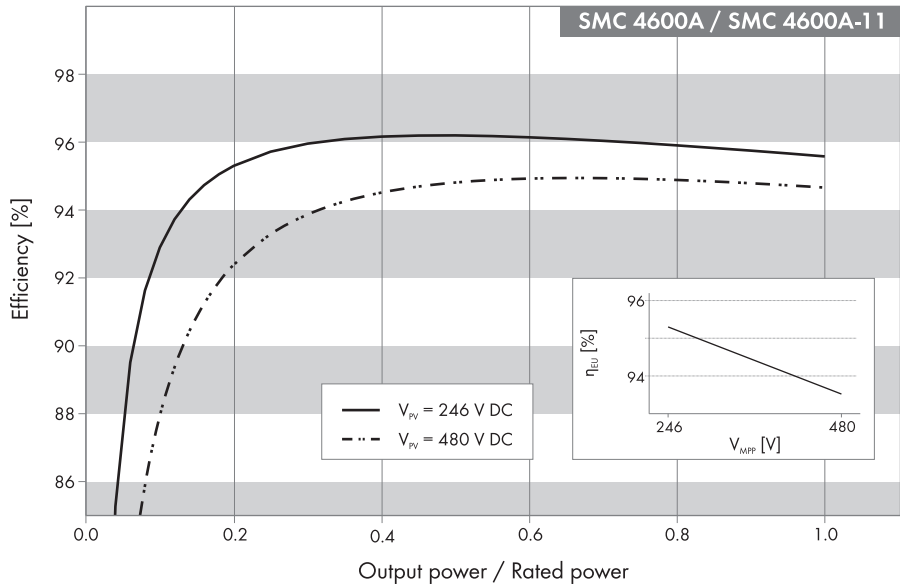
5.27.2 Derating Behavior



6 Sunny Mini Central

6.1 SMC 4600A / SMC 4600A-11

6.1.1 Efficiency



Maximum efficiency, η_{\max} 96.1%

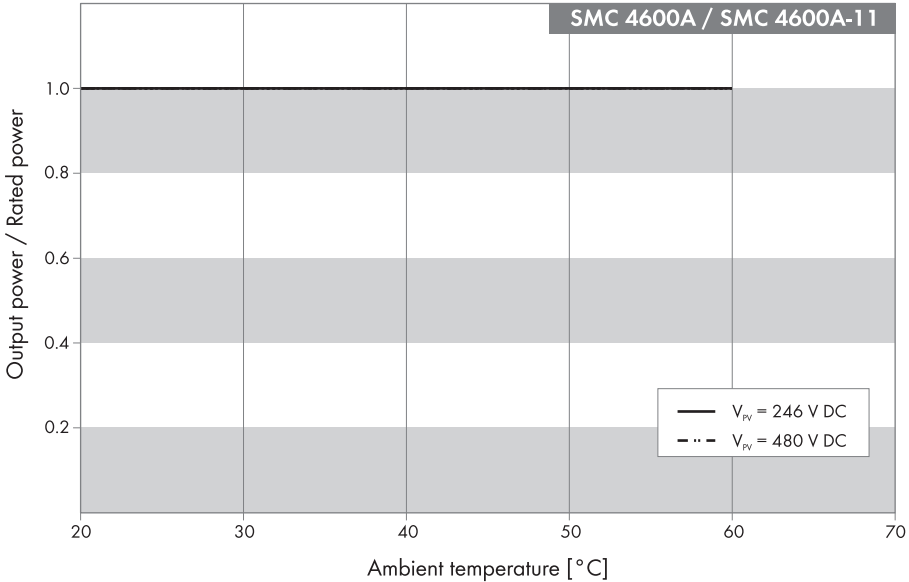
European efficiency, η_{EU} 95.3%

Efficiency Profile

| Standardized output power | Efficiency | |
|---------------------------|---|------------------------------|
| | Minimum MPP voltage / rated input voltage 246 V | Maximum MPP voltage 480 V |
| 5% | 87.4% | 80.1% |
| 10% | 92.9% | 87.9% |
| 20% | 95.3% | 92.4% |
| 25% | 95.7% | 93.3% |
| 30% | 96.0% | 93.9% |
| 50% | 96.1% | 94.8% |

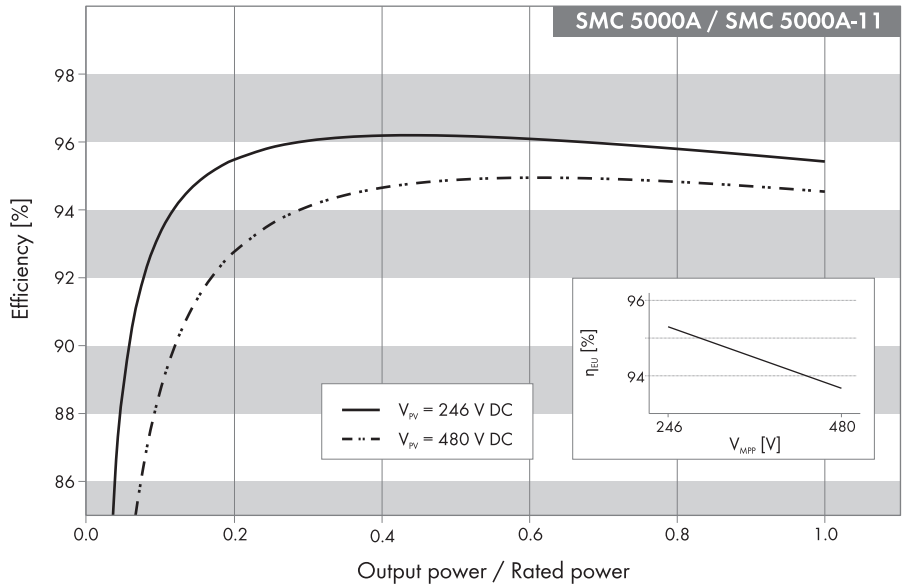
| Standardized output power | Efficiency | |
|---------------------------|--|---------------------|
| | Minimum MPP voltage / rated input voltage | Maximum MPP voltage |
| | 246 V | 480 V |
| 75% | 96.0% | 94.9% |
| 100% | 95.6% | 94.7% |

6.1.2 Derating Behavior



6.2 SMC 5000A / SMC 5000A-11

6.2.1 Efficiency

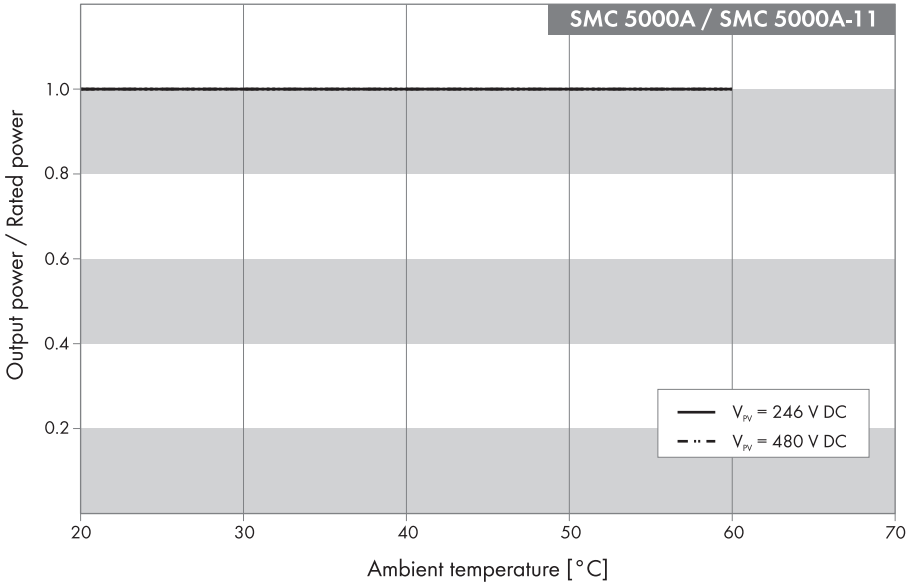


| | |
|---|-------|
| Maximum efficiency, η_{\max} | 96.1% |
| European efficiency, η_{EU} | 95.3% |

Efficiency Profile

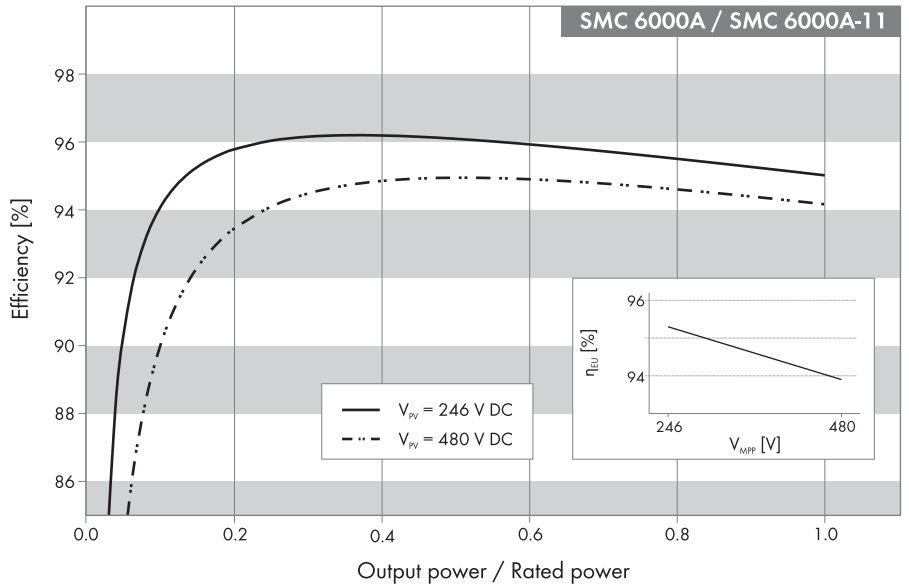
| Standardized output power | Efficiency | |
|---------------------------|---|------------------------------|
| | Minimum MPP voltage / rated input voltage 246 V | Maximum MPP voltage 480 V |
| 5% | 88.1% | 81.2% |
| 10% | 93.2% | 88.6% |
| 20% | 95.4% | 92.8% |
| 25% | 95.7% | 93.6% |
| 30% | 95.9% | 94.1% |
| 50% | 96.1% | 94.9% |
| 75% | 95.8% | 94.9% |
| 100% | 95.3% | 94.5% |

6.2.2 Derating Behavior



6.3
SMC 6000A / SMC 6000A-11

6.3.1
Efficiency

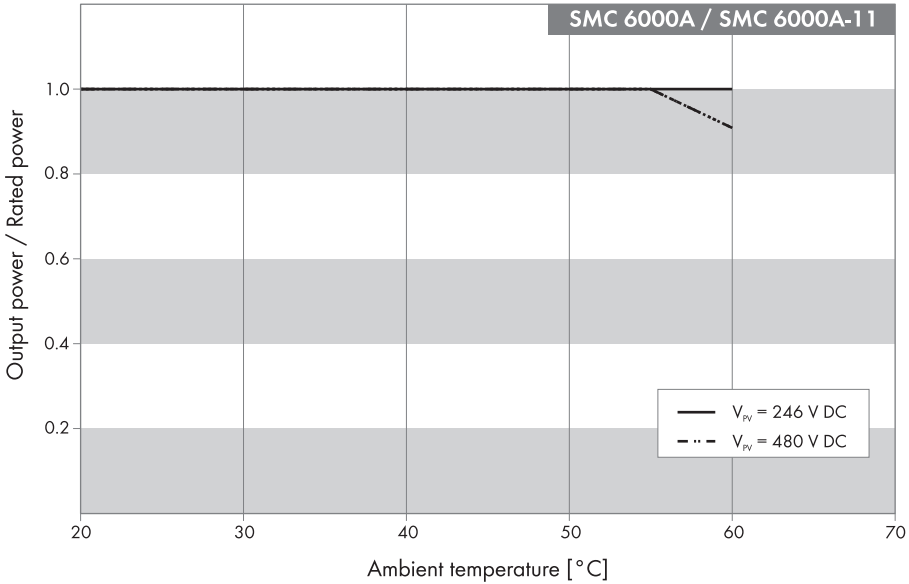


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 96.1% |
| European efficiency, η_{EU} | 95.3% |

Efficiency Profile

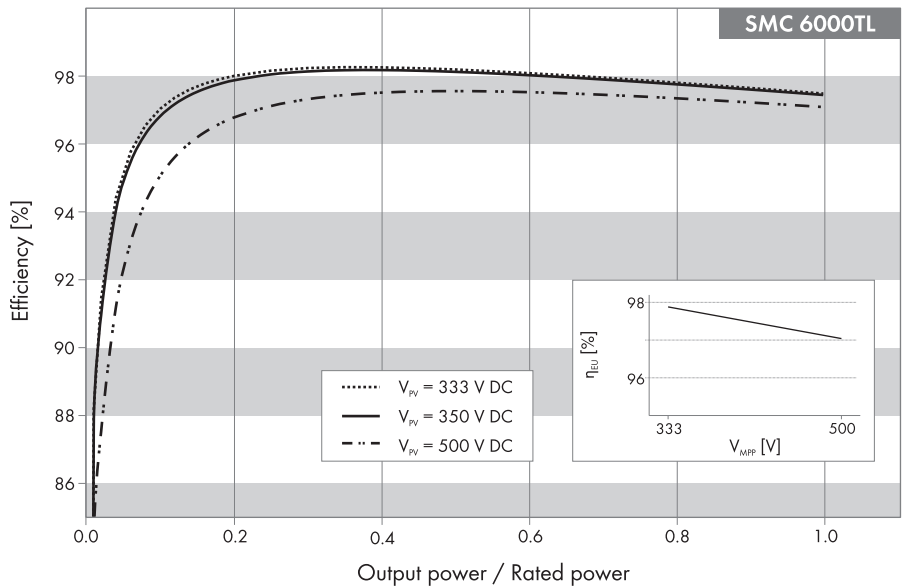
| Standardized output power | Efficiency | |
|---------------------------|---|------------------------------|
| | Minimum MPP voltage / rated input voltage 246 V | Maximum MPP voltage 480 V |
| 5% | 89.8% | 83.4% |
| 10% | 94.0% | 90.0% |
| 20% | 95.7% | 93.4% |
| 25% | 96.0% | 94.1% |
| 30% | 96.1% | 94.5% |
| 50% | 96.0% | 94.9% |
| 75% | 95.6% | 94.7% |
| 100% | 94.9% | 94.2% |

6.3.2 Derating Behavior



6.4 SMC 6000TL

6.4.1 Efficiency

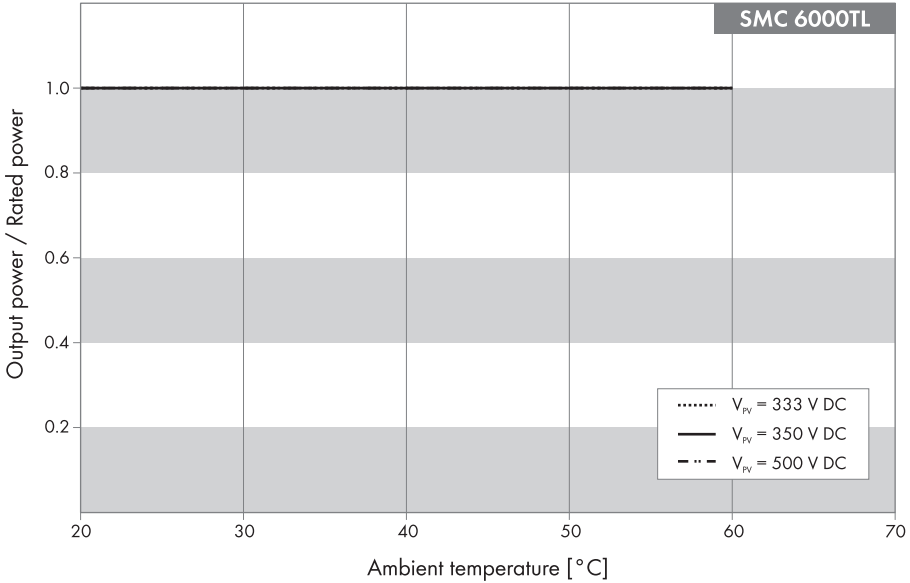


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 98.0% |
| European efficiency, η_{EU} | 97.7% |

Efficiency Profile

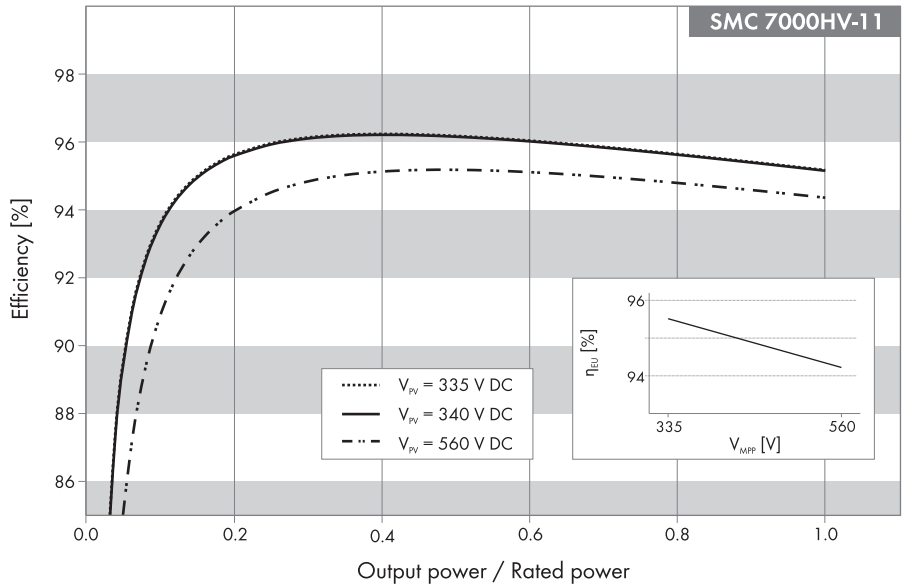
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 333 V | Rated input voltage 350 V | Maximum MPP voltage 500 V |
| 5% | 95.1% | 94.8% | 92.2% |
| 10% | 97.0% | 96.8% | 95.1% |
| 20% | 98.0% | 97.9% | 96.8% |
| 25% | 98.0% | 98.0% | 97.1% |
| 30% | 98.0% | 98.0% | 97.3% |
| 50% | 98.0% | 98.0% | 97.6% |
| 75% | 97.9% | 97.8% | 97.4% |
| 100% | 97.5% | 97.5% | 97.1% |

6.4.2 Derating Behavior



6.5 SMC 7000HV-11

6.5.1 Efficiency

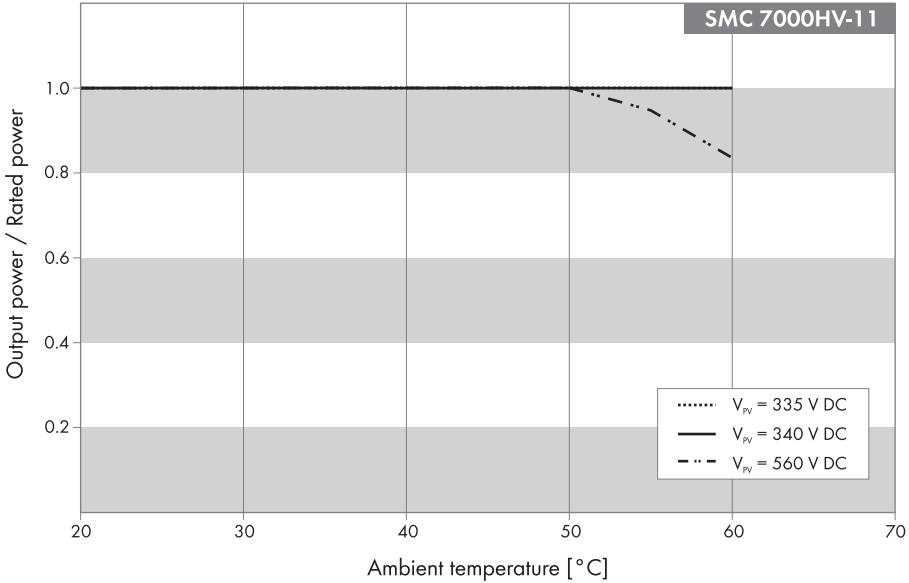


| | |
|---|-------|
| Maximum efficiency, η_{\max} | 96.2% |
| European efficiency, η_{EU} | 95.5% |

Efficiency Profile

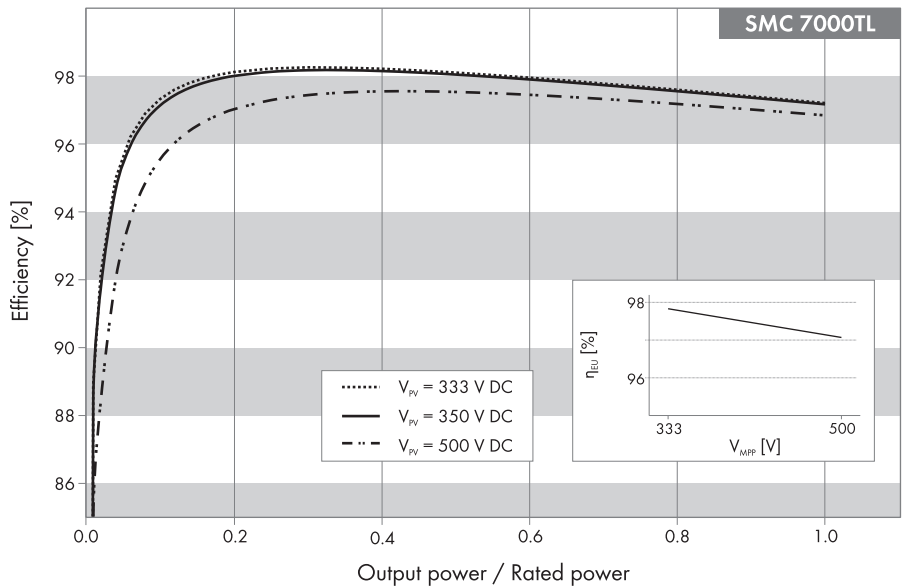
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 335 V | Rated input voltage 340 V | Maximum MPP voltage 560 V |
| 5% | 89.1% | 89.0% | 84.5% |
| 10% | 93.6% | 93.5% | 90.8% |
| 20% | 95.6% | 95.6% | 93.9% |
| 25% | 95.9% | 95.9% | 94.5% |
| 30% | 96.1% | 96.1% | 94.8% |
| 50% | 96.2% | 96.1% | 95.2% |
| 75% | 95.7% | 95.7% | 94.9% |
| 100% | 95.1% | 95.1% | 94.3% |

6.5.2 Derating Behavior



6.6 SMC 7000TL

6.6.1 Efficiency

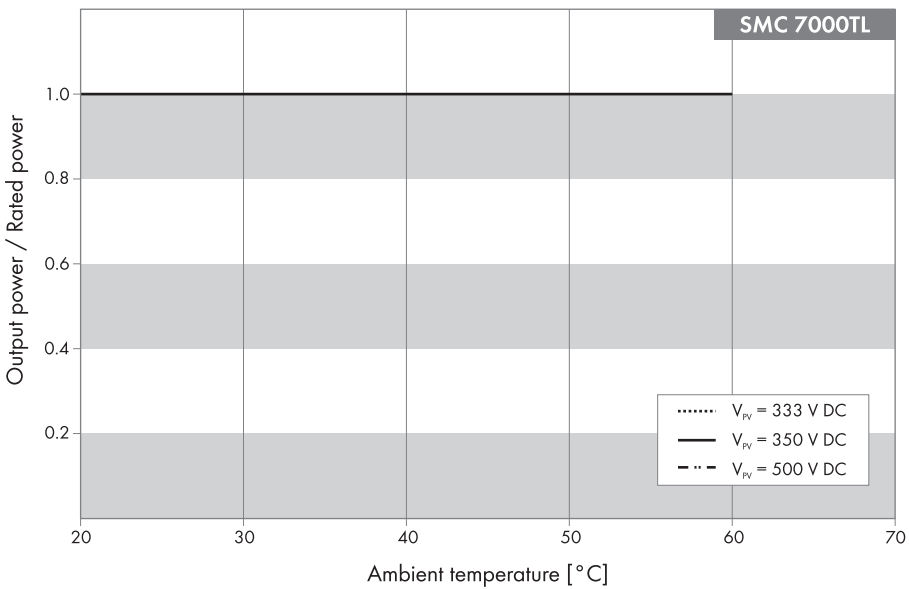


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 98.0% |
| European efficiency, η_{EU} | 97.7% |

Efficiency Profile

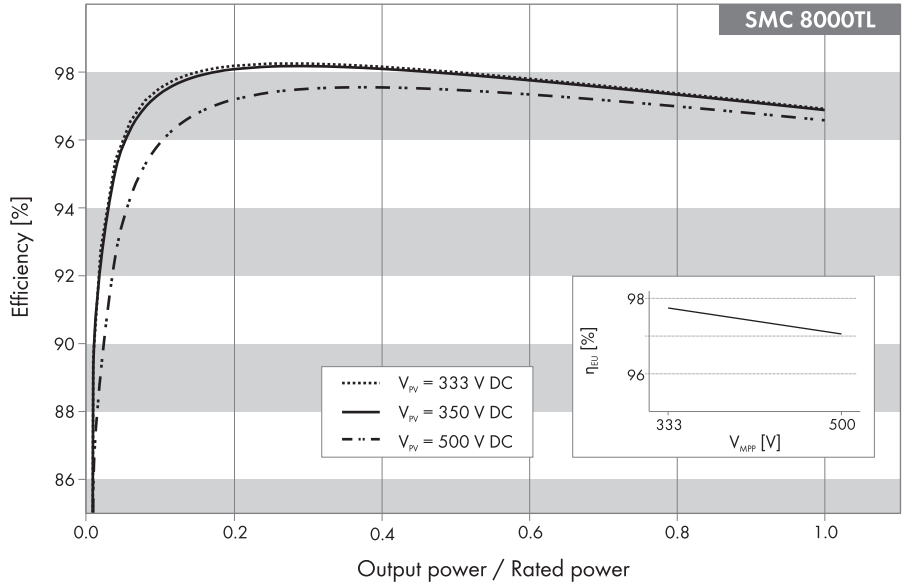
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 333 V | Rated input voltage 350 V | Maximum MPP voltage 500 V |
| 5% | 95.6% | 95.3% | 92.9% |
| 10% | 97.3% | 97.1% | 95.5% |
| 20% | 98.0% | 98.0% | 97.0% |
| 25% | 98.0% | 98.0% | 97.3% |
| 30% | 98.0% | 98.0% | 97.4% |
| 50% | 98.0% | 98.0% | 97.5% |
| 75% | 97.7% | 97.7% | 97.3% |
| 100% | 97.2% | 97.2% | 96.9% |

6.6.2 Derating Behavior



6.7 SMC 8000TL

6.7.1 Efficiency

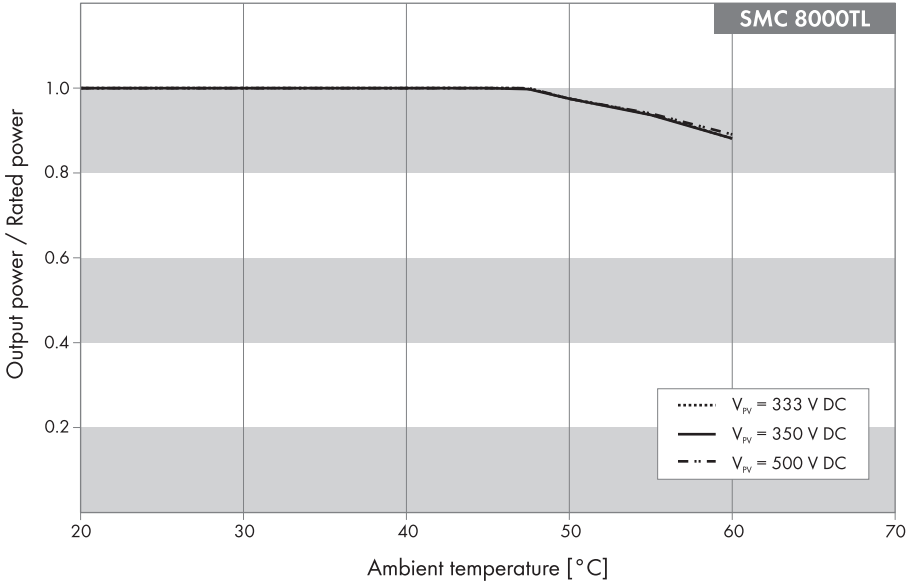


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 98.0% |
| European efficiency, η_{EU} | 97.7% |

Efficiency Profile

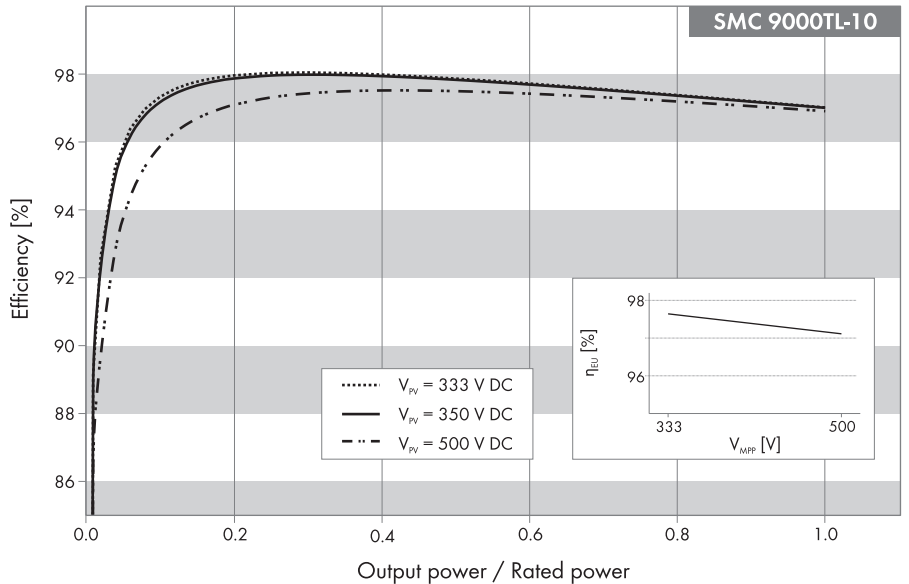
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 333 V | Rated input voltage 350 V | Maximum MPP voltage 500 V |
| 5% | 96.0% | 95.7% | 93.4% |
| 10% | 97.5% | 97.4% | 95.9% |
| 20% | 98.0% | 98.0% | 97.2% |
| 25% | 98.0% | 98.0% | 97.4% |
| 30% | 98.0% | 98.0% | 97.5% |
| 50% | 98.0% | 98.0% | 97.5% |
| 75% | 97.5% | 97.5% | 97.1% |
| 100% | 96.9% | 96.9% | 96.6% |

6.7.2 Derating Behavior



6.8 SMC 9000TL-10

6.8.1 Efficiency

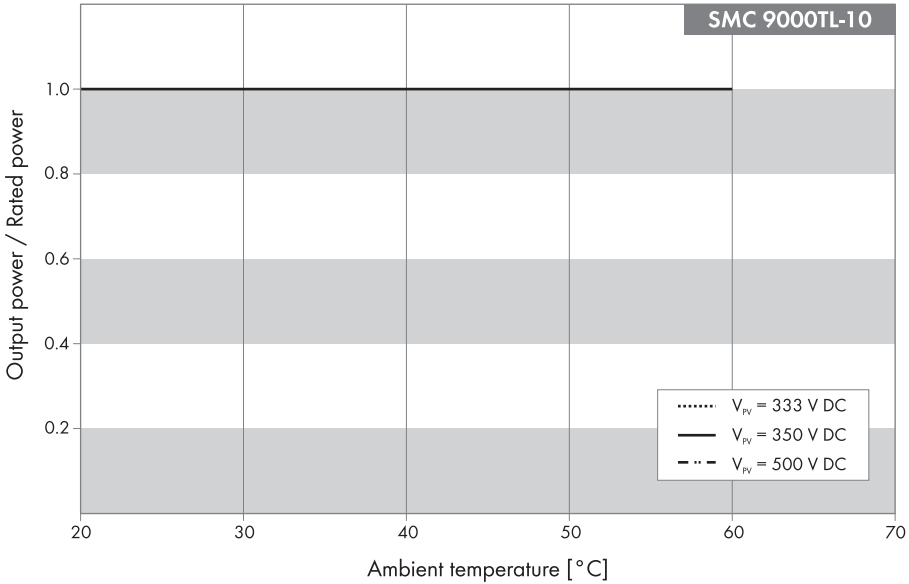


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 98.0% |
| European efficiency, η_{EU} | 97.6% |

Efficiency Profile

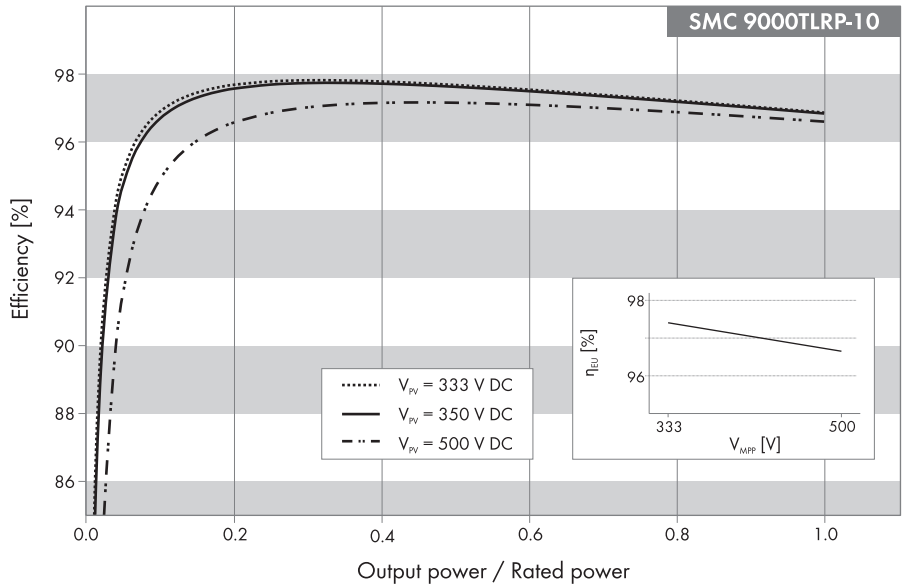
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 333 V | Rated input voltage 350 V | Maximum MPP voltage 500 V |
| 5% | 95.8% | 95.6% | 93.6% |
| 10% | 97.3% | 97.2% | 95.9% |
| 20% | 98.0% | 97.9% | 97.1% |
| 25% | 98.0% | 98.0% | 97.3% |
| 30% | 98.0% | 98.0% | 97.4% |
| 50% | 97.9% | 97.8% | 97.5% |
| 75% | 97.5% | 97.5% | 97.3% |
| 100% | 97.0% | 97.0% | 96.9% |

6.8.2 Derating Behavior



6.9 SMC 9000TLRP-10

6.9.1 Efficiency

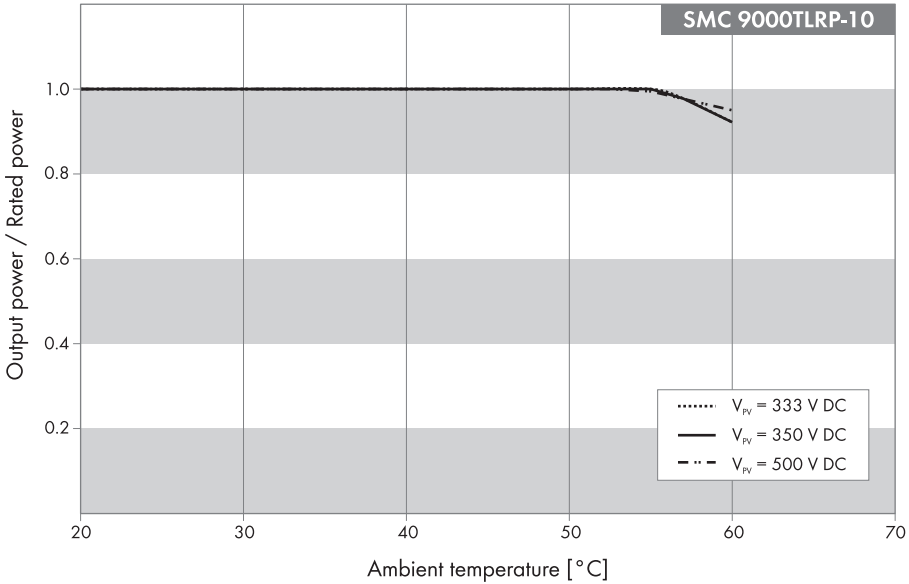


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 97.7% |
| European efficiency, η_{EU} | 97.3% |

Efficiency Profile

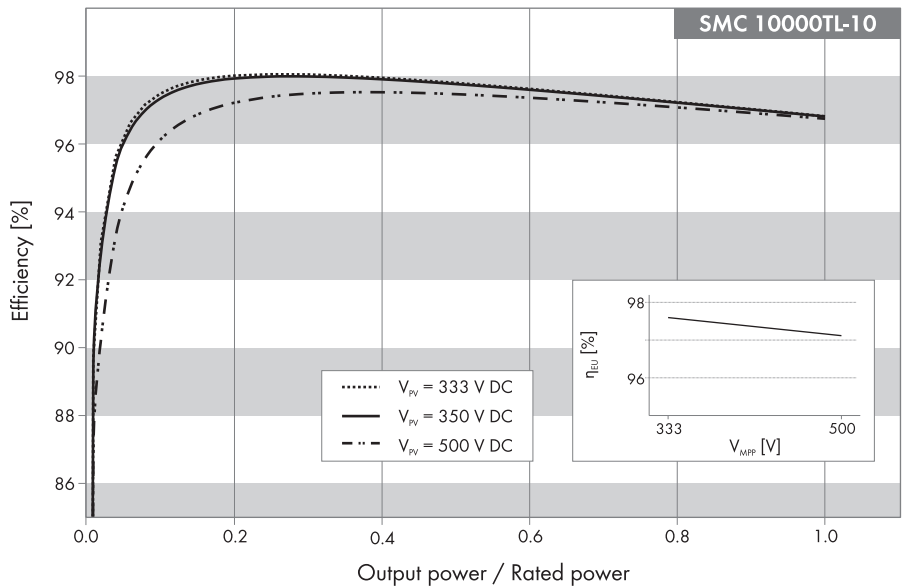
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 333 V | Rated input voltage 350 V | Maximum MPP voltage 500 V |
| 5% | 95.0% | 94.6% | 91.3% |
| 10% | 96.9% | 96.7% | 94.9% |
| 20% | 97.7% | 97.6% | 96.6% |
| 25% | 97.7% | 97.7% | 96.9% |
| 30% | 97.7% | 97.7% | 97.0% |
| 50% | 97.7% | 97.6% | 97.2% |
| 75% | 97.3% | 97.3% | 96.9% |
| 100% | 96.9% | 96.8% | 96.6% |

6.9.2 Derating Behavior



6.10 SMC 10000TL-10

6.10.1 Efficiency

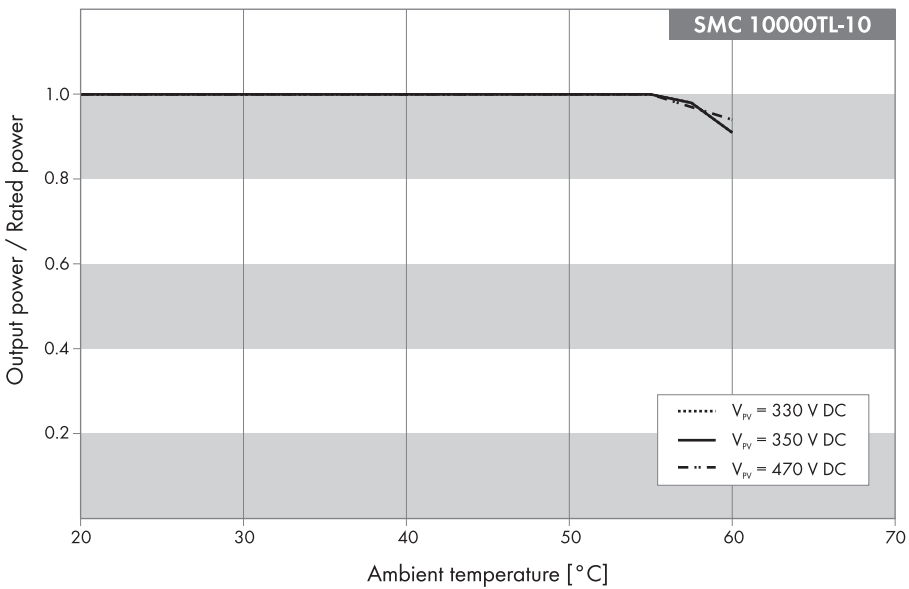


| | |
|----------------------------------|-------|
| Maximum efficiency, η_{max} | 98.0% |
| European efficiency, η_{EU} | 97.5% |

Efficiency Profile

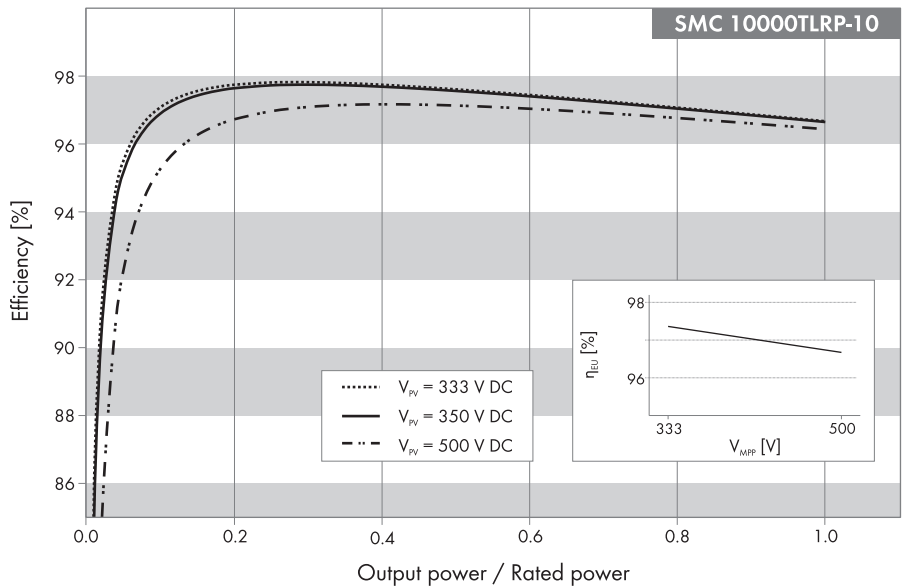
| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 333 V | Rated input voltage 350 V | Maximum MPP voltage 500 V |
| 5% | 96.1% | 95.9% | 94.0% |
| 10% | 97.5% | 97.3% | 96.1% |
| 20% | 98.0% | 97.9% | 97.2% |
| 25% | 98.0% | 98.0% | 97.4% |
| 30% | 98.0% | 98.0% | 97.5% |
| 50% | 97.8% | 97.8% | 97.5% |
| 75% | 97.3% | 97.3% | 97.2% |
| 100% | 96.8% | 96.8% | 96.7% |

6.10.2 Derating Behavior



6.11
SMC 10000TLRP-10

6.11.1
Efficiency

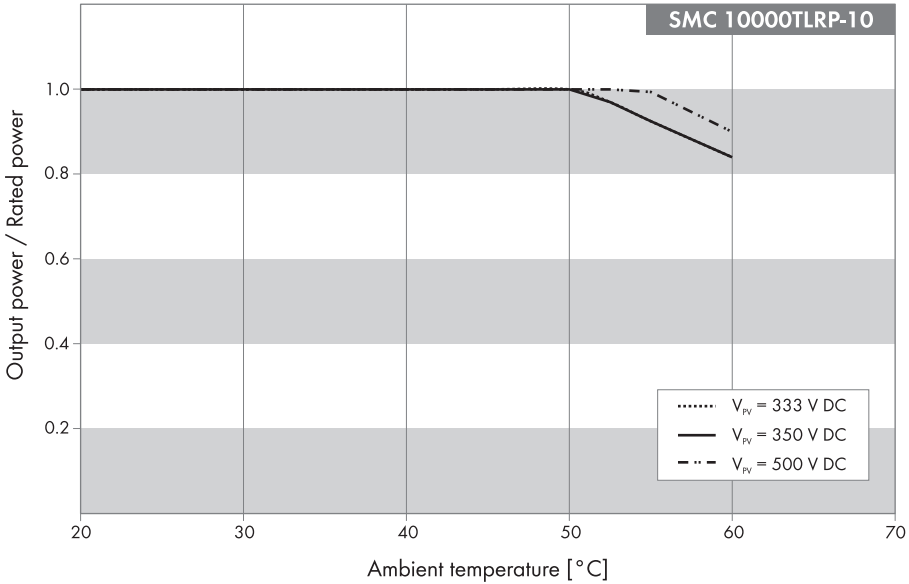


| | |
|---|-------|
| Maximum efficiency, η_{max} | 97.7% |
| European efficiency, η_{EU} | 97.2% |

Efficiency Profile

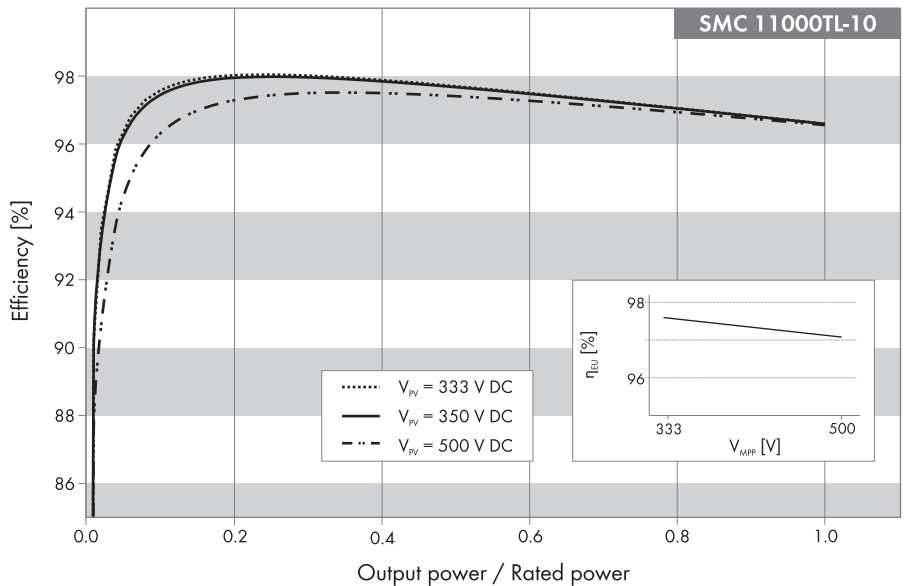
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 333 V | Rated input voltage 350 V | Maximum MPP voltage 500 V |
| 5% | 95.3% | 95.0% | 92.0% |
| 10% | 97.1% | 96.9% | 95.3% |
| 20% | 97.7% | 97.6% | 96.7% |
| 25% | 97.7% | 97.7% | 97.0% |
| 30% | 97.7% | 97.7% | 97.1% |
| 50% | 97.6% | 97.5% | 97.1% |
| 75% | 97.2% | 97.0% | 96.8% |
| 100% | 96.7% | 96.4% | 96.4% |

6.11.2 Derating Behavior



6.12
SMC 11000TL-10

6.12.1
Efficiency

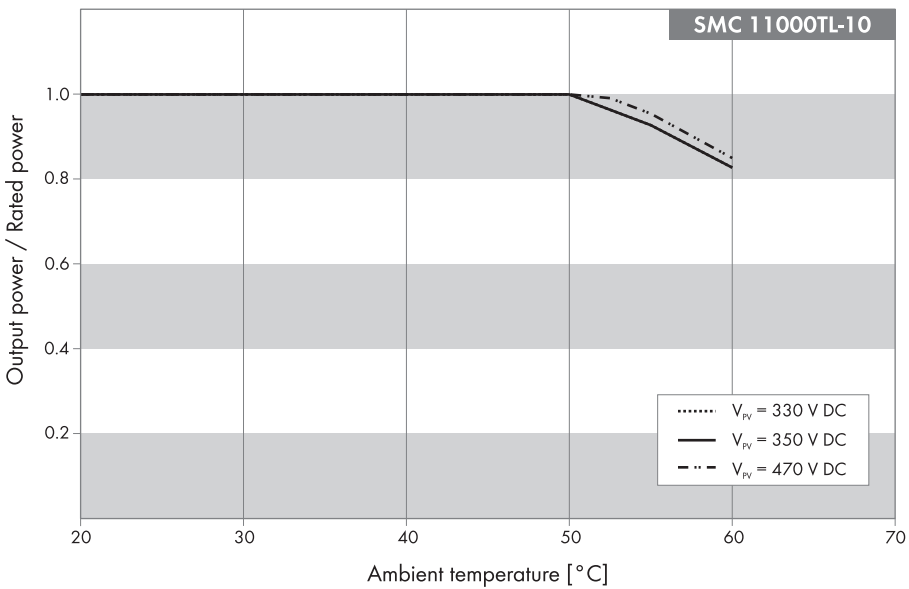


| | |
|---|-------|
| Maximum efficiency, η_{\max} | 98.0% |
| European efficiency, η_{EU} | 97.5% |

Efficiency Profile

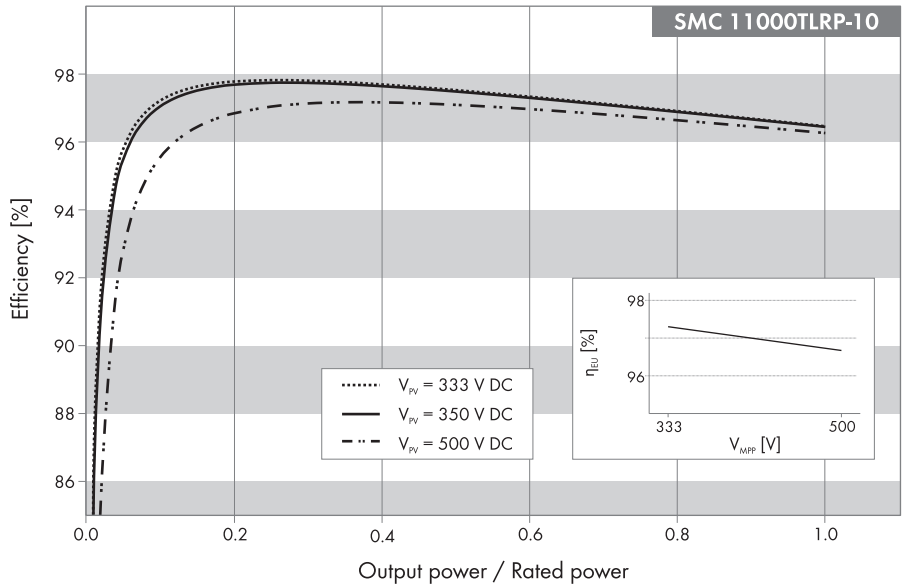
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 333 V | Rated input voltage 350 V | Maximum MPP voltage 500 V |
| 5% | 96.3% | 96.1% | 94.3% |
| 10% | 97.6% | 97.5% | 96.3% |
| 20% | 98.0% | 98.0% | 97.3% |
| 25% | 98.0% | 98.0% | 97.4% |
| 30% | 98.0% | 98.0% | 97.5% |
| 50% | 97.7% | 97.7% | 97.4% |
| 75% | 97.2% | 97.2% | 97.0% |
| 100% | 96.6% | 96.6% | 96.6% |

6.12.2 Derating Behavior



6.13 SMC 11000TLRP-10

6.13.1 Efficiency

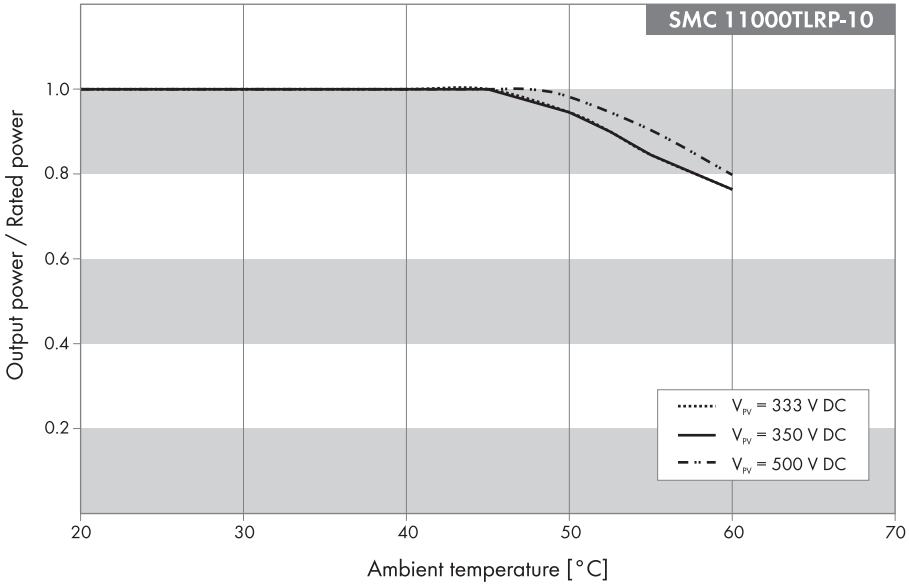


| | |
|---|-------|
| Maximum efficiency, η_{max} | 97.7% |
| European weighted efficiency, η_{EU} | 97.2% |

Efficiency Profile

| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 333 V | Rated input voltage 350 V | Maximum MPP voltage 500 V |
| 5% | 95.6% | 95.3% | 92.5% |
| 10% | 97.2% | 97.0% | 95.5% |
| 20% | 97.7% | 97.7% | 96.8% |
| 25% | 97.7% | 97.7% | 97.0% |
| 30% | 97.7% | 97.7% | 97.1% |
| 50% | 97.5% | 97.5% | 97.1% |
| 75% | 97.0% | 97.0% | 96.7% |
| 100% | 96.5% | 96.4% | 96.3% |

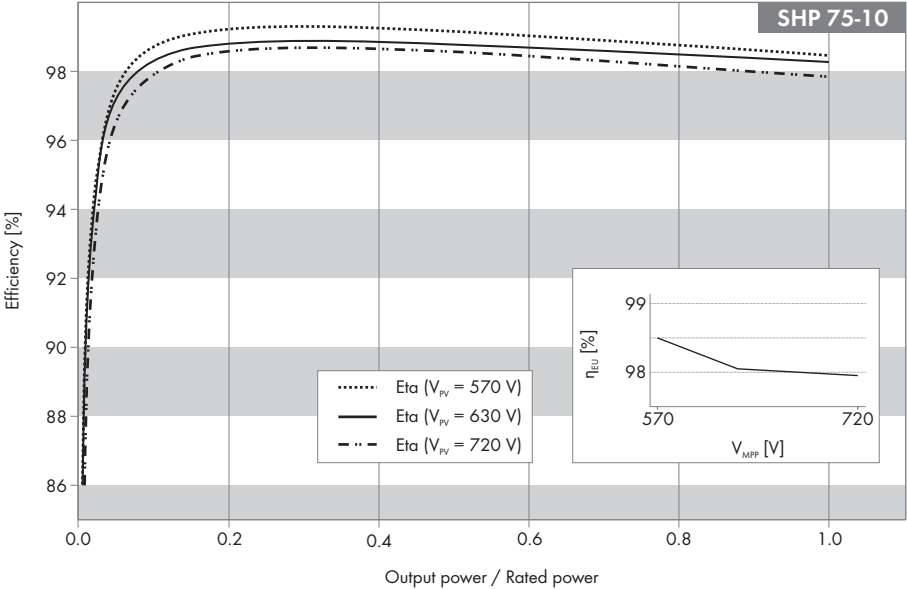
6.13.2 Derating Behavior



7 Sunny Highpower PEAK1

7.1 SHP 75-10

7.1.1 Efficiency



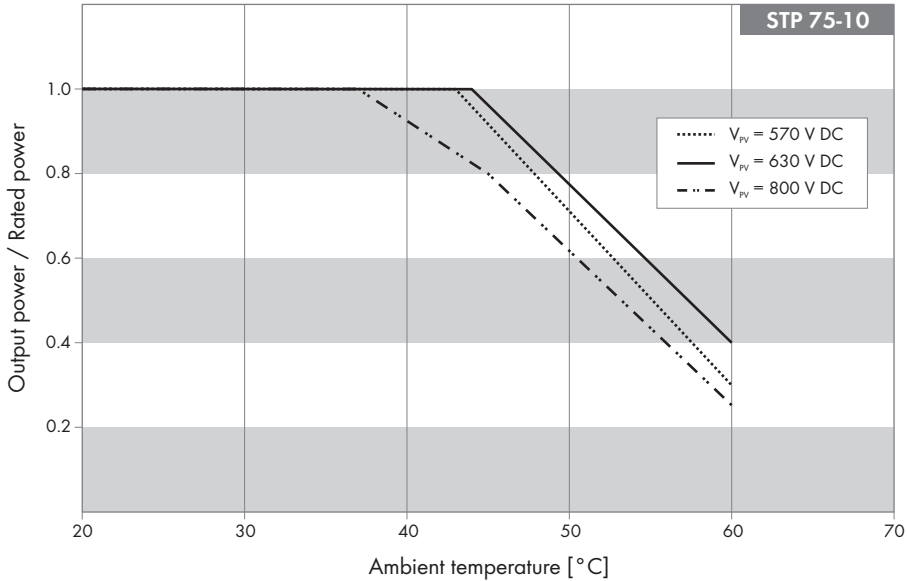
| | |
|---|--------|
| Maximum efficiency, η_{max} | 98.8 % |
| European weighted efficiency, η_{EU} | 98.2 % |

Efficiency Profile

| Standardized output power | Efficiency | | |
|---------------------------|---------------------------|---------------------------|---------------------------|
| | Minimum MPP voltage 570 V | Rated input voltage 630 V | Maximum MPP voltage 720 V |
| 5 % | 96.9 % | 96.6 % | 95.9 % |
| 10 % | 98.2 % | 97.8 % | 97.5 % |
| 20 % | 98.8 % | 98.3 % | 98.1 % |
| 25 % | 98.8 % | 98.4 % | 98.2 % |
| 30 % | 98.8 % | 98.4 % | 98.2 % |
| 50 % | 98.7 % | 98.3 % | 98.1 % |

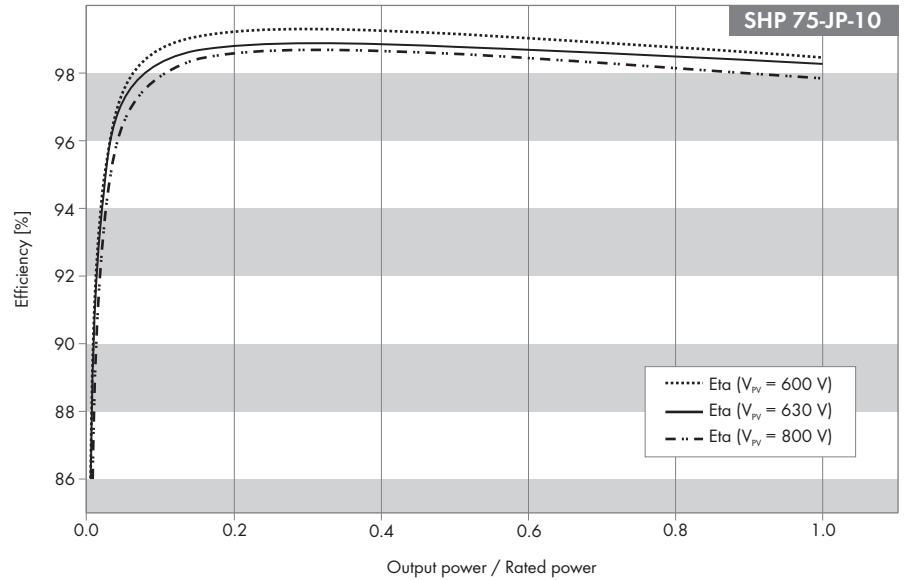
| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 570 V | Rated input voltage 630 V | Maximum MPP voltage 720 V |
| 75 % | 98.4 % | 98.1 % | 97.8 % |
| 100 % | 98.0 % | 97.8 % | 97.4 % |

7.1.2 Derating Behavior



7.2 SHP 75-JP-10

7.2.1 Efficiency

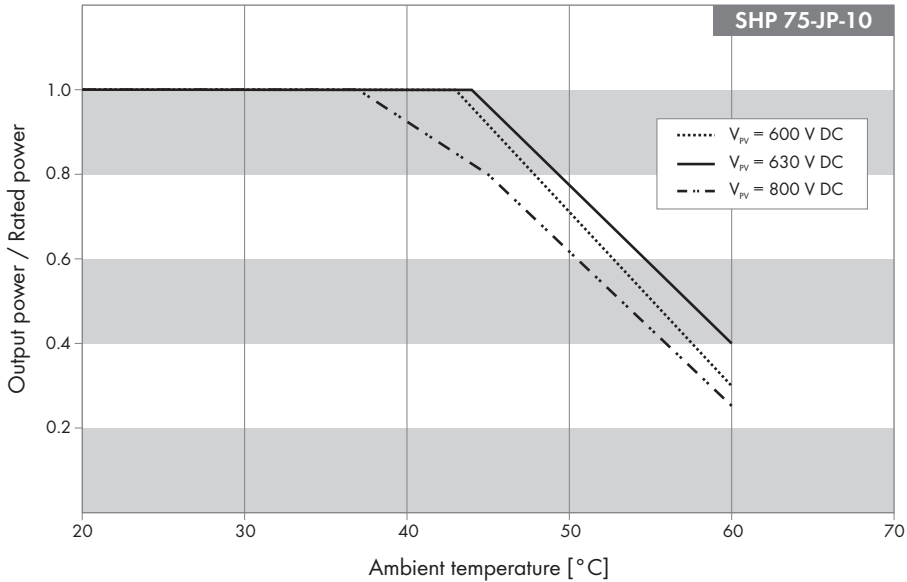


| | |
|--|--------|
| Maximum efficiency, η_{max} | 98.8 % |
| European weighted efficiency, η_{EU} | 98.2 % |

Efficiency Profile

| Standardized output power | Efficiency | | |
|---------------------------|------------------------------|------------------------------|------------------------------|
| | Minimum MPP voltage 600 V | Rated input voltage 630 V | Maximum MPP voltage 800 V |
| 5 % | 96.9 % | 96.6 % | 95.9 % |
| 10 % | 98.2 % | 97.8 % | 97.5 % |
| 20 % | 98.8 % | 98.3 % | 98.1 % |
| 25 % | 98.8 % | 98.4 % | 98.2 % |
| 30 % | 98.8 % | 98.4 % | 98.2 % |
| 50 % | 98.7 % | 98.3 % | 98.1 % |
| 75 % | 98.4 % | 98.1 % | 97.8 % |
| 100 % | 98.0 % | 97.8 % | 97.4 % |

7.2.2 Derating Behavior



ENERGY
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