

Product Summary

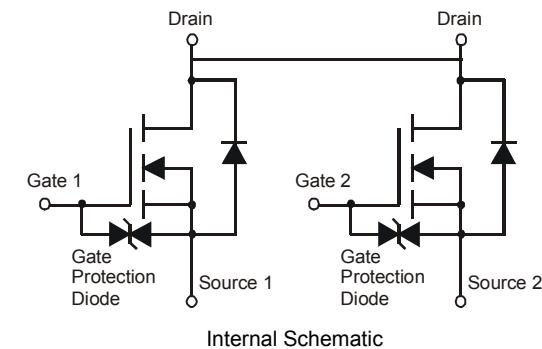
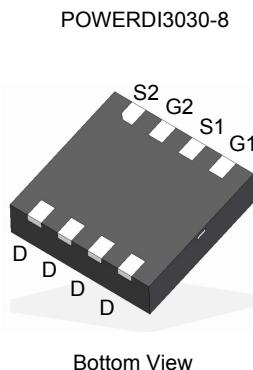
| $V_{(BR)DSS}$ | $R_{DS(ON)} \text{ max}$ | $I_D \text{ max}$ $T_A = +25^\circ\text{C}$ |
|---------------|---------------------------------------|--|
| 20V | 20m Ω @ $V_{GS} = 10\text{V}$ | 6.8A |
| | 22m Ω @ $V_{GS} = 4.5\text{V}$ | 6.5A |
| | 26m Ω @ $V_{GS} = 2.5\text{V}$ | 6.1A |
| | 36m Ω @ $V_{GS} = 1.8\text{V}$ | 5.2A |

Description

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- Power management functions
- Load Switch



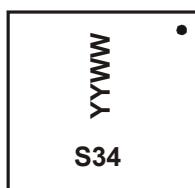
Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|---------------|-------------------|
| DMN2028UFDH-7 | POWERDI3030-8 | 3,000/Tape & Reel |

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information



S34 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Digit of Year (ex: 13 = 2013)
 WW = Week Code (01 to 53)

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Units |
|--|------------------|--|-----------|------------|-------|
| Drain-Source Voltage | | | V_{DSS} | 20 | V |
| Gate-Source Voltage (Note 5) | | | V_{GSS} | ± 12 | V |
| Continuous Drain Current (Note 7) $V_{GS} = 10\text{V}$ | Steady State | $T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$ | I_D | 6.8 5.8 | A |
| | $t < 10\text{s}$ | $T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$ | I_D | 8.8 7.0 | A |
| Maximum Body Diode Forward Current (Note 7) | | | I_S | 2 | A |
| Pulsed Drain Current (10 μs pulse, Duty cycle = 1%) | | | I_{DM} | 40 | A |

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Units |
|--|------------------|--|-----------------|-------------|-------|
| Total Power Dissipation (Note 6) | | | P_D | 1.1 | W |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady state | | $R_{\theta JA}$ | 118 | °C/W |
| | $t < 10\text{s}$ | | | 72 | |
| Total Power Dissipation (Note 7) | | | P_D | 1.5 | W |
| Thermal Resistance, Junction to Ambient (Note 7) | Steady state | | $R_{\theta JA}$ | 82 | °C/W |
| | $t < 10\text{s}$ | | | 50 | |
| Thermal Resistance, Junction to Case (Note 7) | | | $R_{\theta JC}$ | 14 | |
| Operating and Storage Temperature Range | | | T_J, T_{STG} | -55 to +150 | °C |

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---------------------|-----|-----|----------|------------------|--|
| OFF CHARACTERISTICS (Note 8) | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | 20 | — | — | V | $V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$ |
| Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$ | I_{DSS} | — | — | 1 | μA | $V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$ |
| Gate-Source Leakage | I_{GSS} | — | — | ± 10 | μA | $V_{GS} = \pm 10\text{V}, V_{DS} = 0\text{V}$ |
| ON CHARACTERISTICS (Note 8) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | 0.5 | — | 1 | V | $V_{DS} = V_{GS}, I_D = 250\mu\text{A}$ |
| Static Drain-Source On-Resistance | $R_{DS(\text{ON})}$ | — | 16 | 20 | $\text{m}\Omega$ | $V_{GS} = 10\text{V}, I_D = 4\text{A}$ |
| | | | 17 | 22 | | $V_{GS} = 4.5\text{V}, I_D = 4\text{A}$ |
| | | | 19 | 26 | | $V_{GS} = 2.5\text{V}, I_D = 4\text{A}$ |
| | | | 24 | 36 | | $V_{GS} = 1.8\text{V}, I_D = 4\text{A}$ |
| Forward Transfer Admittance | $ Y_{fs} $ | — | 8 | — | S | $V_{DS} = 5\text{V}, I_D = 12\text{A}$ |
| Diode Forward Voltage | V_{SD} | — | 0.7 | 1.0 | V | $V_{GS} = 0\text{V}, I_S = 5\text{A}$ |
| DYNAMIC CHARACTERISTICS (Note 9) | | | | | | |
| Input Capacitance | C_{iss} | — | 151 | — | pF | $V_{DS} = 10\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$ |
| Output Capacitance | C_{oss} | — | 91 | — | pF | |
| Reverse Transfer Capacitance | C_{rss} | — | 32 | — | pF | $V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$ |
| Gate Resistance | R_g | — | 200 | — | Ω | |
| Total Gate Charge | Q_g | — | 8.5 | — | nC | $V_{GS} = 4.5\text{V}, V_{DS} = 10\text{V}, I_D = 6.5\text{A}$ |
| Gate-Source Charge | Q_{gs} | — | 1.6 | — | nC | |
| Gate-Drain Charge | Q_{gd} | — | 2.8 | — | nC | $V_{GS} = 10\text{V}, V_{DS} = 4.5\text{V}, R_G = 6\Omega, R_L = 1.0\Omega, I_D = 1\text{A}$ |
| Turn-On Delay Time | $t_{D(on)}$ | — | 53 | — | ns | |
| Turn-On Rise Time | t_r | — | 77 | — | ns | |
| Turn-Off Delay Time | $t_{D(off)}$ | — | 561 | — | ns | |
| Turn-Off Fall Time | t_f | — | 234 | — | ns | |

Notes:

5. AEC-Q101 V_{GS} maximum is $\pm 9.6\text{V}$.
6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
7. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to production testing.

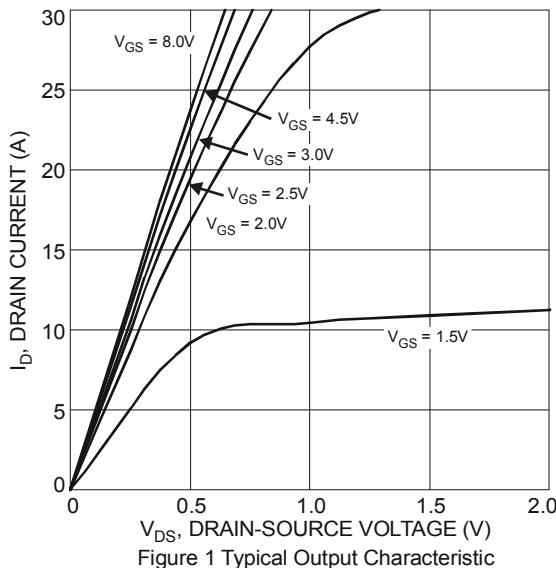


Figure 1 Typical Output Characteristic

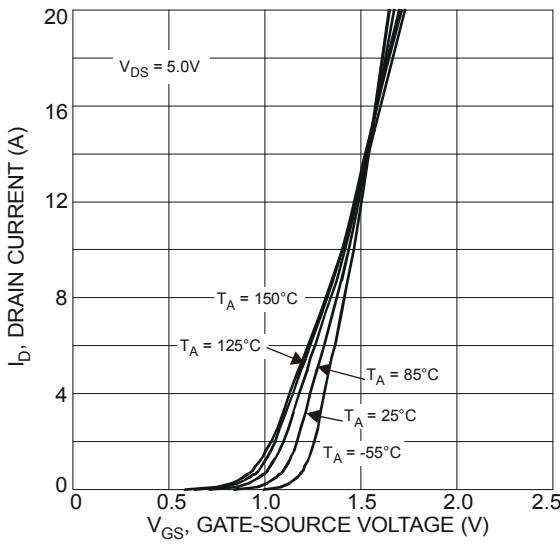


Figure 2 Typical Transfer Characteristics

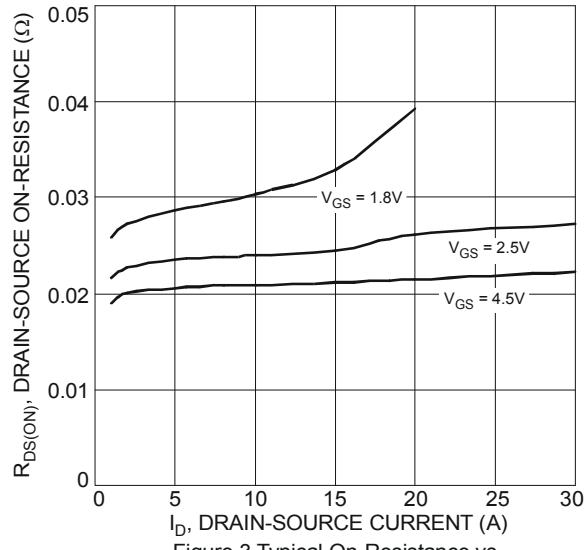


Figure 3 Typical On-Resistance vs.
Drain Current and Gate Voltage

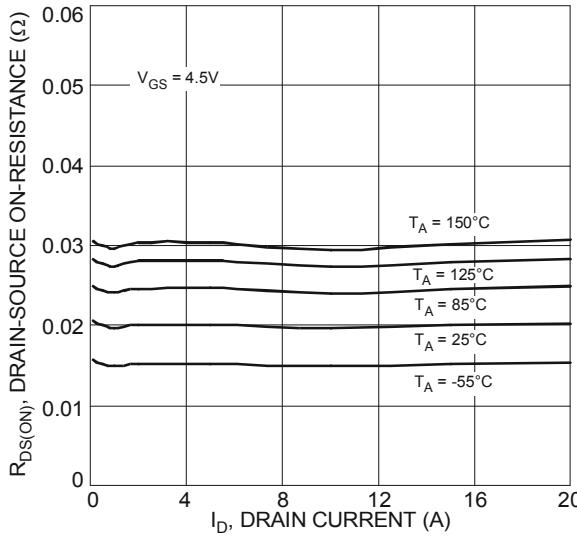


Figure 4 Typical On-Resistance vs.
Drain Current and Temperature

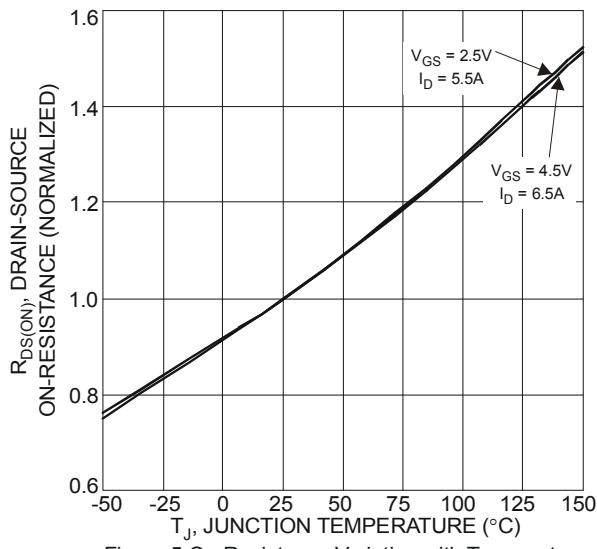


Figure 5 On-Resistance Variation with Temperature

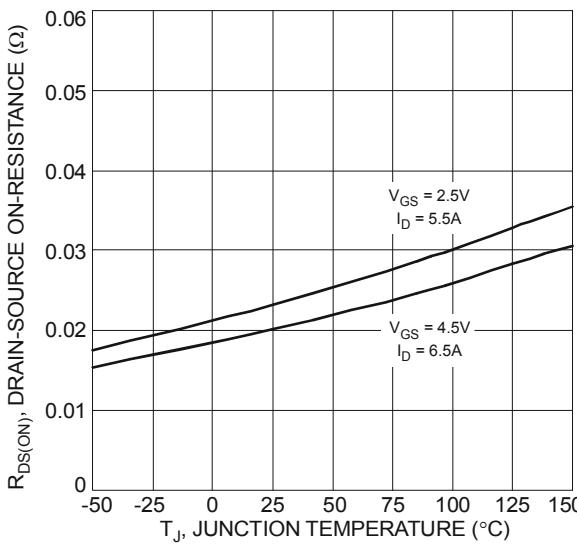


Figure 6 On-Resistance Variation with Temperature

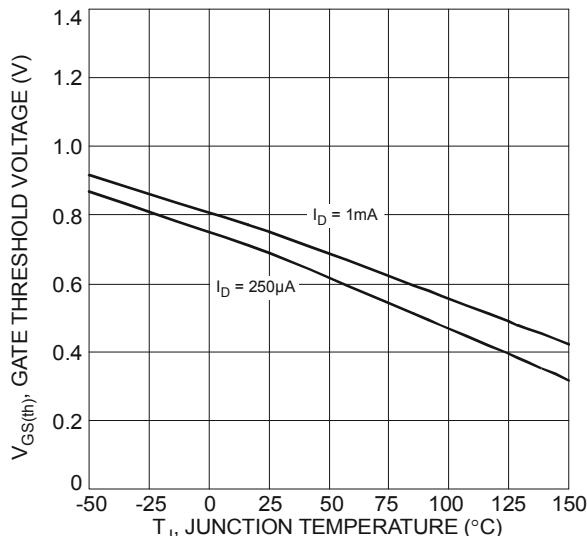


Figure 7 Gate Threshold Variation vs. Ambient Temperature

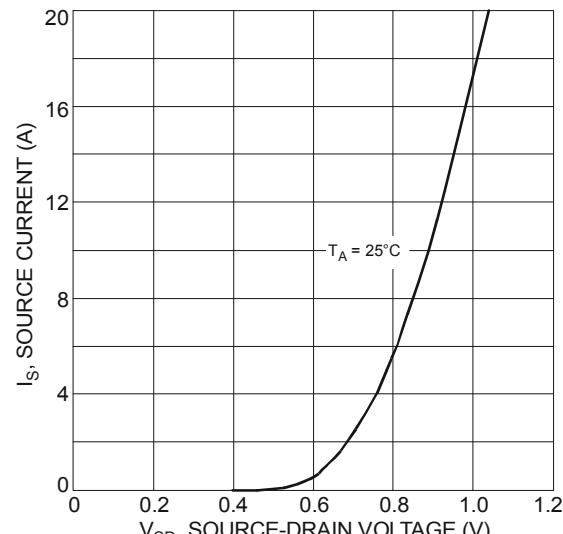


Figure 8 Diode Forward Voltage vs. Current

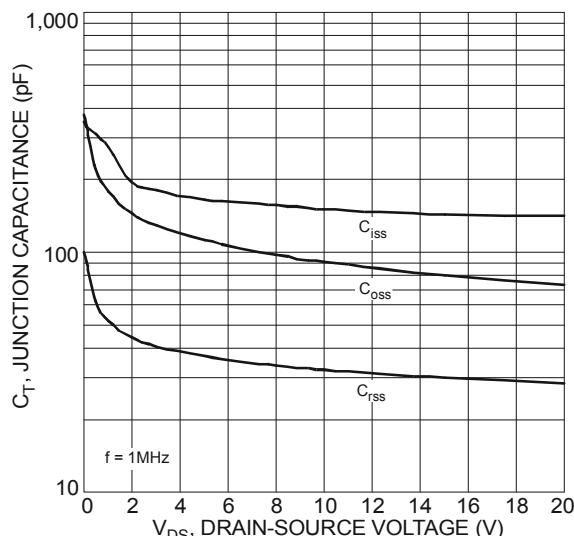


Figure 9 Typical Junction Capacitance

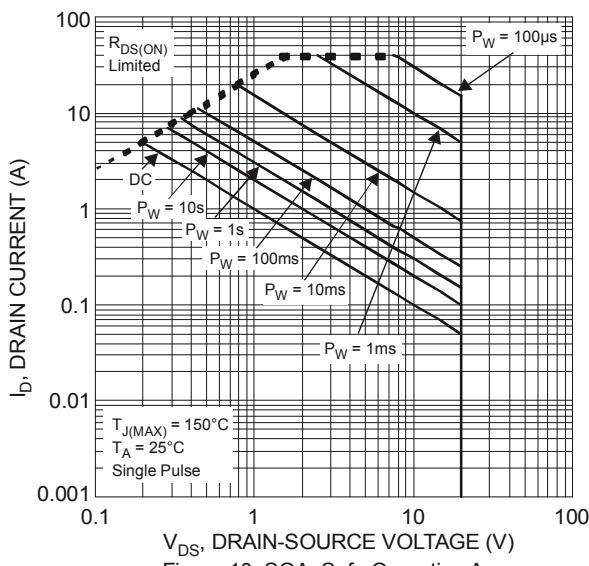


Figure 10 SOA, Safe Operation Area

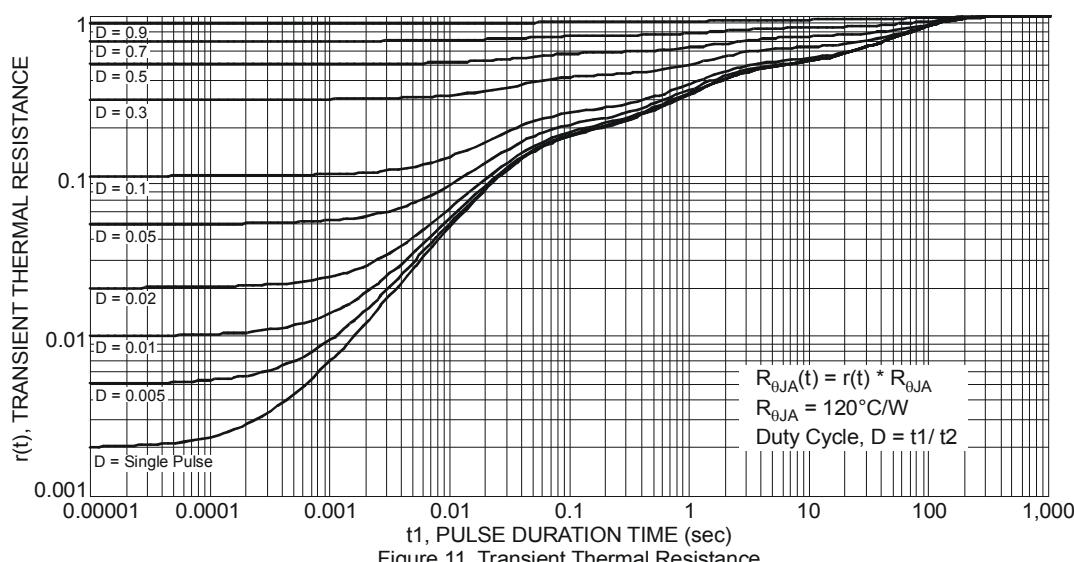
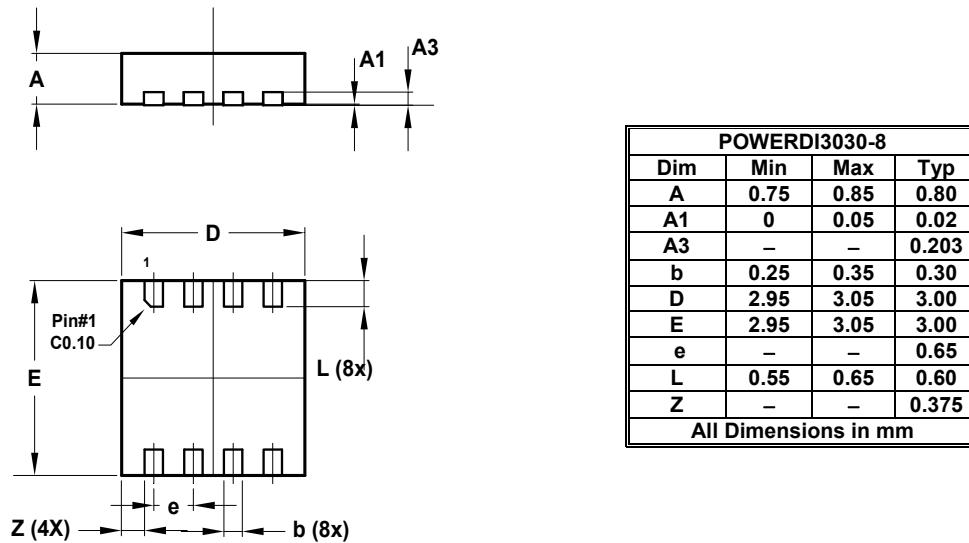


Figure 11 Transient Thermal Resistance

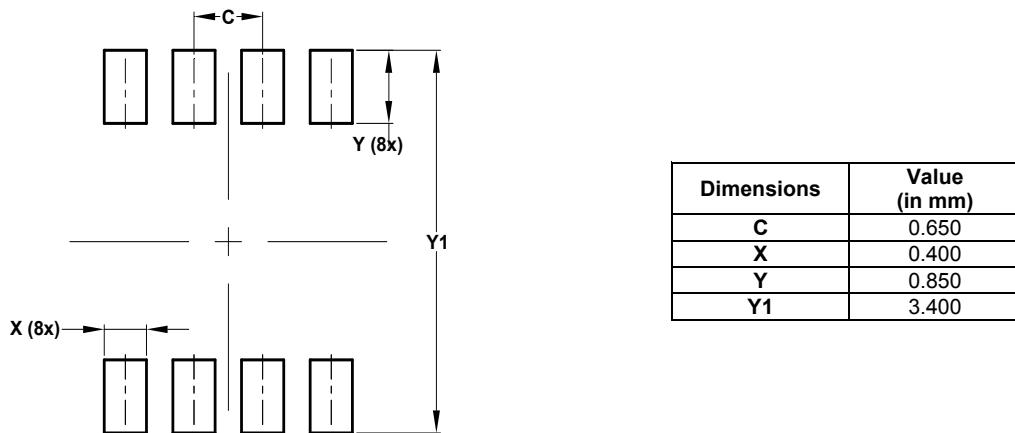
Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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