

RJK03L3DNS

Silicon N Channel Power MOS FET with Schottky Barrier Diode
Power Switching

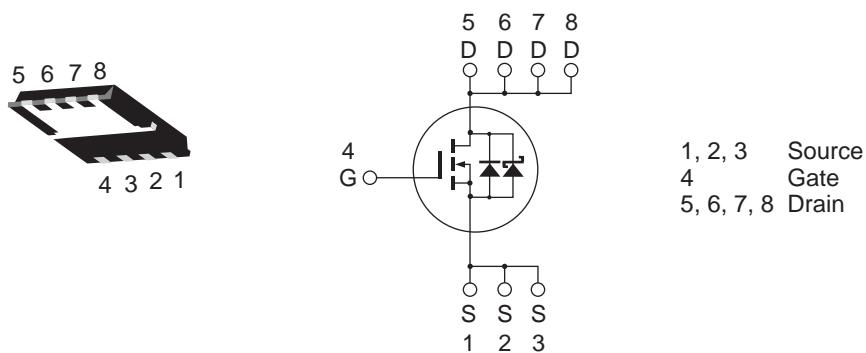
R07DS0780EJ0110
Rev.1.10
May 30, 2012

Features

- High speed switching
- Capable of 4.5 V gate drive
- Low drive current
- High density mounting
- Low on-resistance
 $R_{DS(on)} = 5.3 \text{ m}\Omega \text{ typ. (at } V_{GS} = 10 \text{ V)}$
- Pb-free
- Halogen-free

Outline

RENESAS Package code: PWSN0008JB-A
(Package name: HWSN-8)



Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Ratings | Unit |
|--|--|-------------|------|
| Drain to source voltage | V _{DSS} | 30 | V |
| Gate to source voltage | V _{GSS} | ±20 | V |
| Drain current | I _D | 25 | A |
| Drain peak current | I _{D(pulse)} ^{Note1} | 100 | A |
| Body-drain diode reverse drain current | I _{DR} | 25 | A |
| Avalanche current | I _{AP} ^{Note 2} | 10.5 | A |
| Avalanche energy | E _{AS} ^{Note 2} | 11 | mJ |
| Channel dissipation | P _{ch} ^{Note3} | 15 | W |
| Channel to case thermal impedance | θ _{ch-c} ^{Note3} | 8.33 | °C/W |
| Channel temperature | T _{ch} | 150 | °C |
| Storage temperature | T _{stg} | -55 to +150 | °C |

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
2. Value at T_{ch} = 25°C, R_g ≥ 50 Ω
3. T_c = 25°C

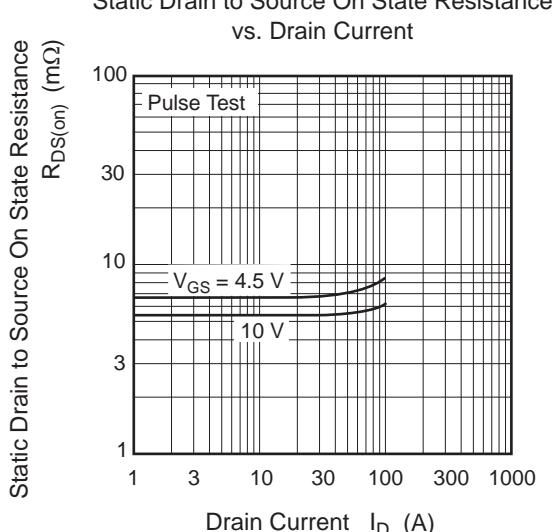
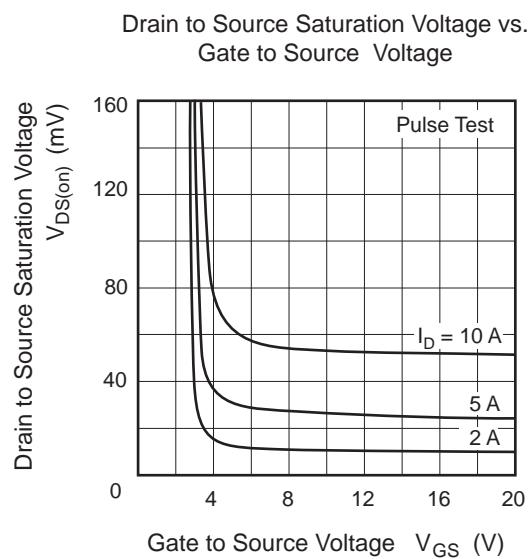
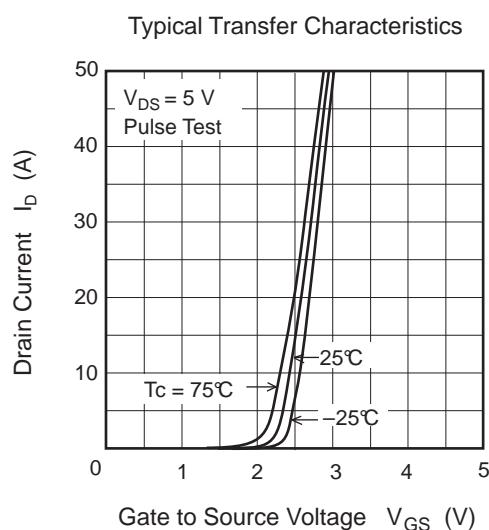
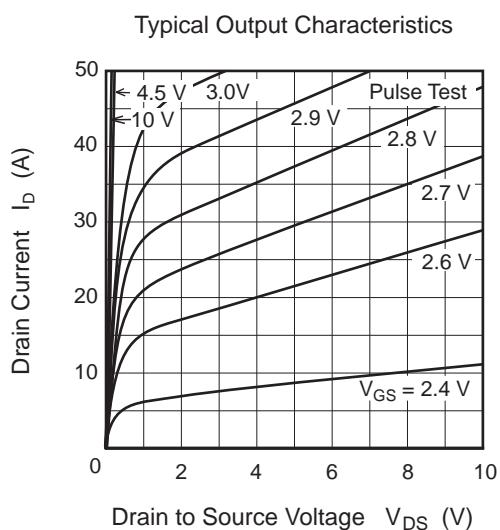
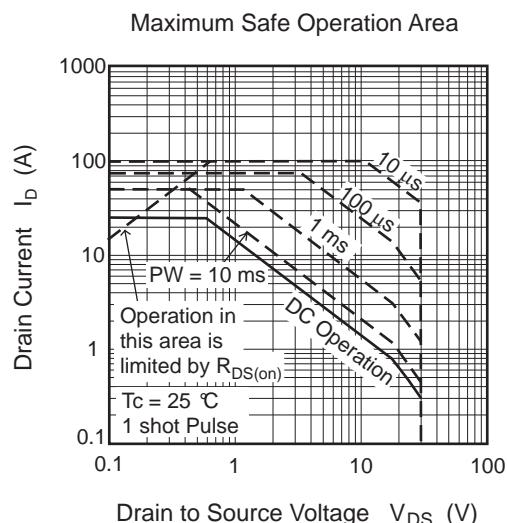
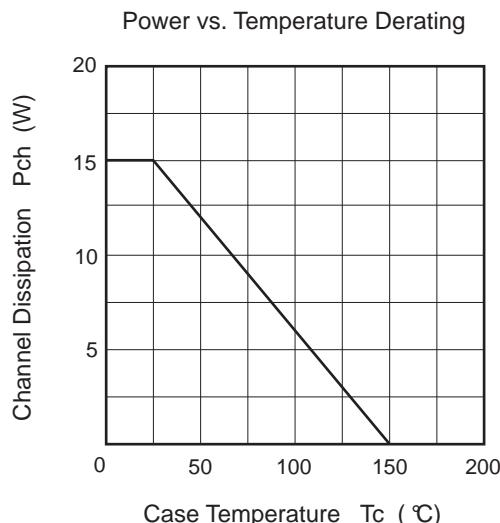
Electrical Characteristics

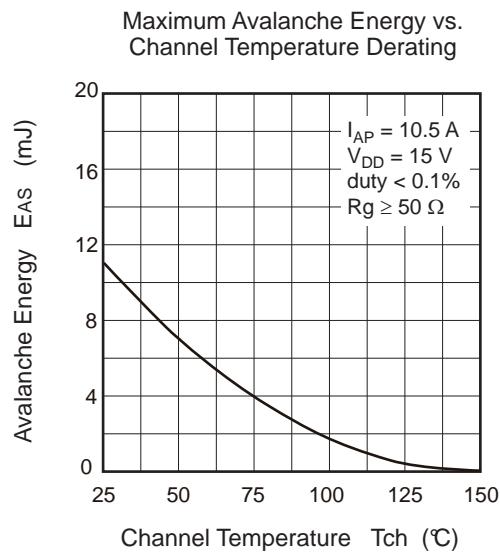
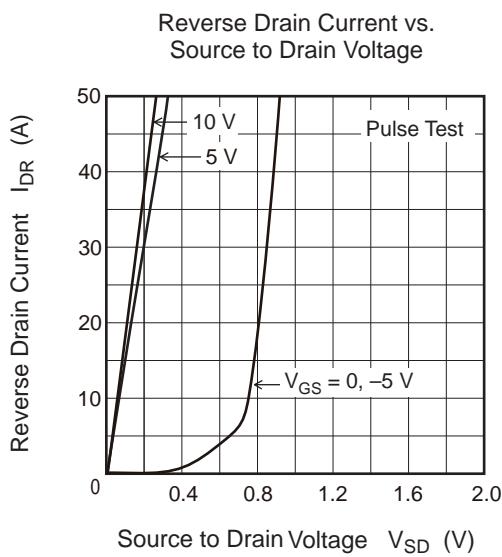
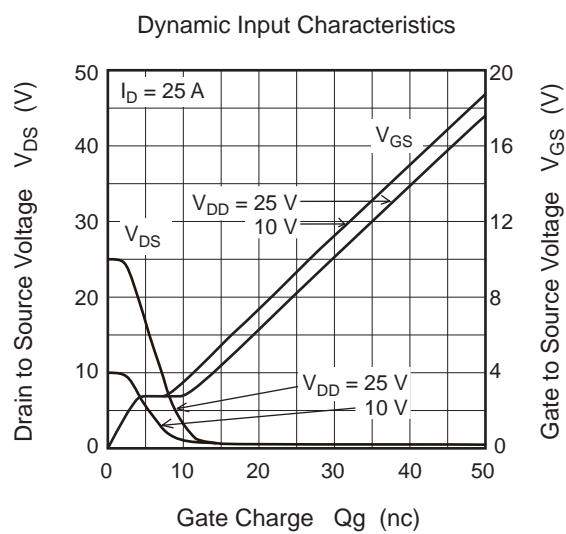
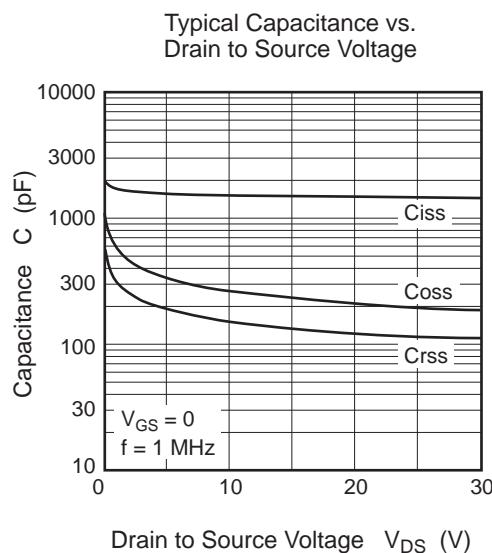
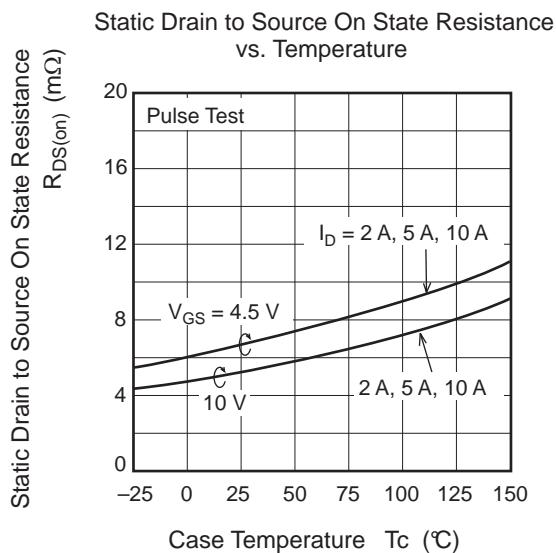
(Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|--|----------------------|-----|------|------|------|--|
| Drain to source breakdown voltage | V _{(BR)DSS} | 30 | — | — | V | I _D = 10 mA, V _{GS} = 0 |
| Gate to source leak current | I _{GSS} | — | — | ±0.5 | μA | V _{GS} = ±20 V, V _{DS} = 0 |
| Zero gate voltage drain current | I _{DSS} | — | — | 1 | mA | V _{DS} = 24 V, V _{GS} = 0 |
| Gate to source cutoff voltage | V _{GS(off)} | 1.2 | — | 2.5 | V | V _{DS} = 10 V, I _D = 1 mA |
| Static drain to source on state resistance | R _{DS(on)} | — | 5.3 | 6.4 | mΩ | I _D = 12.5A, V _{GS} = 10 V ^{Note4} |
| | R _{DS(on)} | — | 6.7 | 8.7 | mΩ | I _D = 12.5A, V _{GS} = 4.5 V ^{Note4} |
| Forward transfer admittance | y _{fs} | — | 50 | — | S | I _D = 12.5A, V _{DS} = 5 V ^{Note4} |
| Input capacitance | C _{iss} | — | 1550 | 2170 | pF | V _{DS} = 10 V |
| Output capacitance | C _{oss} | — | 265 | — | pF | V _{GS} = 0 |
| Reverse transfer capacitance | C _{rss} | — | 155 | — | pF | f = 1 MHz |
| Gate Resistance | R _g | — | 1.7 | 3.4 | Ω | |
| Total gate charge | Q _g | — | 12.3 | — | nC | V _{DD} = 10 V |
| Gate to source charge | Q _{gs} | — | 4.0 | — | nC | V _{GS} = 4.5 V |
| Gate to drain charge | Q _{gd} | — | 3.7 | — | nC | I _D = 25 A |
| Turn-on delay time | t _{d(on)} | — | 3.9 | — | ns | V _{GS} = 10 V, I _D = 12.5A |
| Rise time | t _r | — | 3.7 | — | ns | V _{DD} ≈ 10 V |
| Turn-off delay time | t _{d(off)} | — | 29 | — | ns | R _L = 0.8 Ω |
| Fall time | t _f | — | 9.4 | — | ns | R _g = 4.7 Ω |
| Body-drain diode forward voltage | V _{DF} | — | 0.47 | — | V | I _F = 2 A, V _{GS} = 0 ^{Note4} |
| Body-drain diode reverse recovery time | t _{rr} | — | 6.4 | — | ns | I _F = 25 A, V _{GS} = 0 di _F / dt = 500 A/ μs |

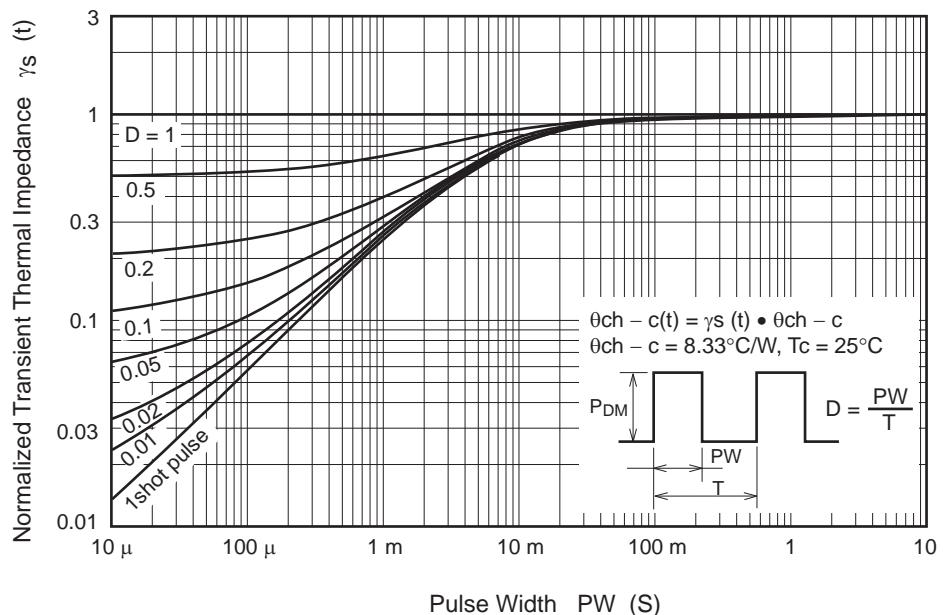
Notes: 4. Pulse test

Main Characteristics

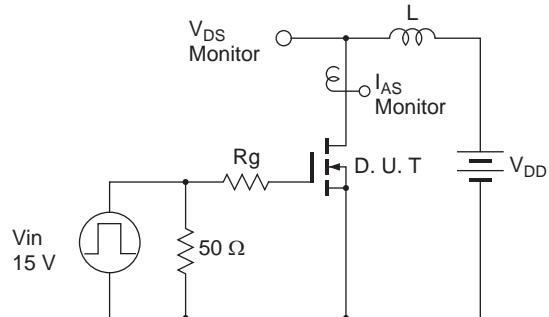




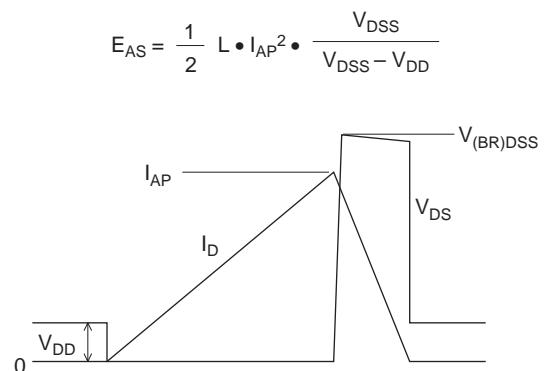
Normalized Transient Thermal Impedance vs. Pulse Width



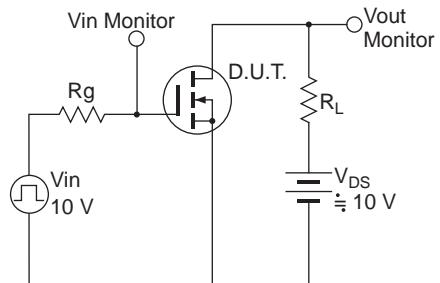
Avalanche Test Circuit



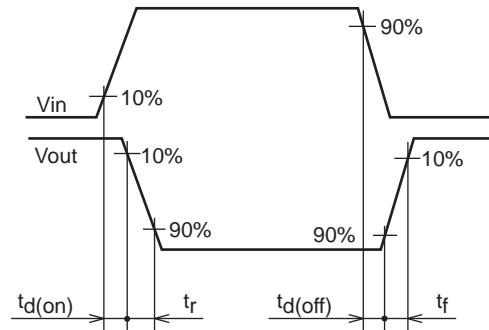
Avalanche Waveform



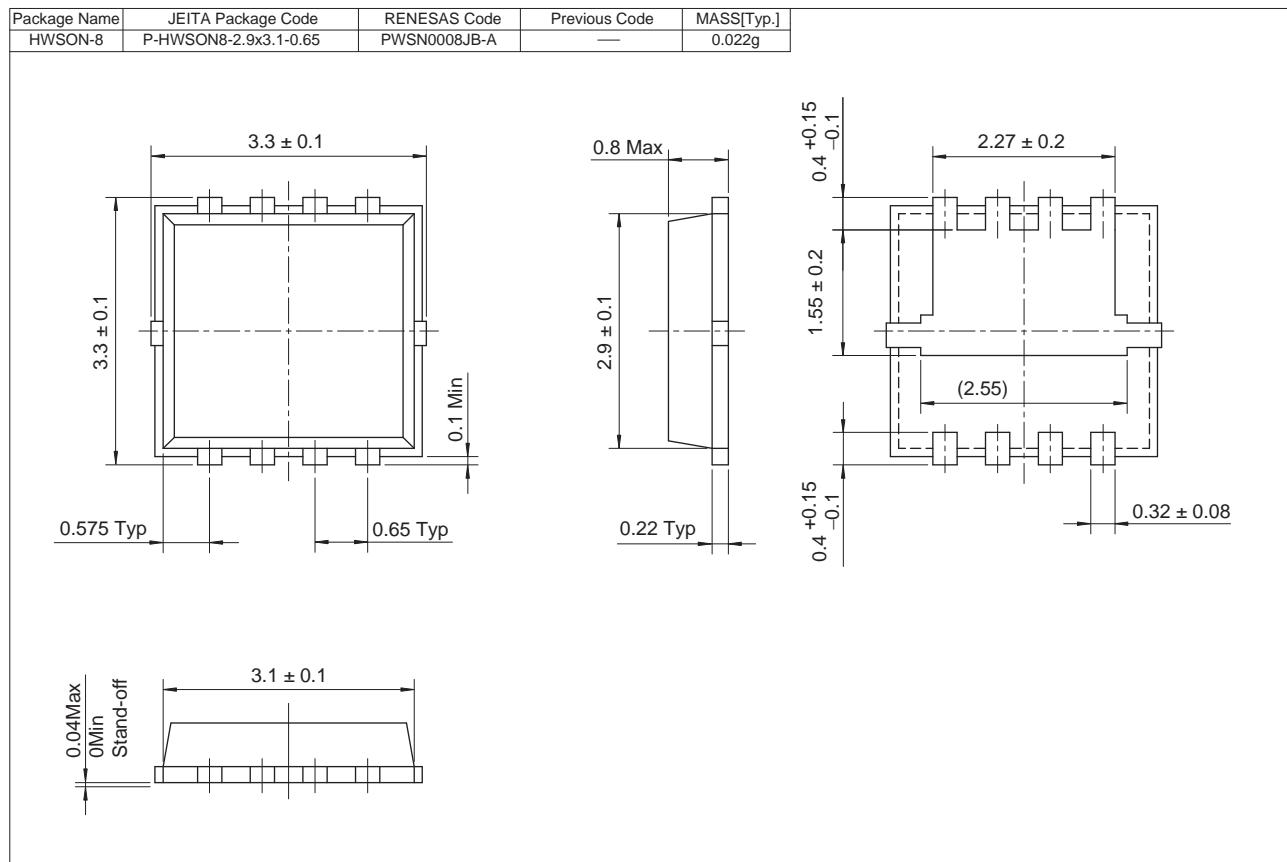
Switching Time Test Circuit



Switching Time Waveform



Package Dimensions



Ordering Information

| Orderable Part Number | Quantity | Shipping Container |
|-----------------------|----------|--------------------|
| RJK03L3DNS-00-J5 | 5000 pcs | Taping |

Note: The symbol of 2nd "-" is occasionally presented as "#".

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