

H5N2008P

Silicon N Channel MOS FET
High Speed Power Switching

REJ03G0390-0300

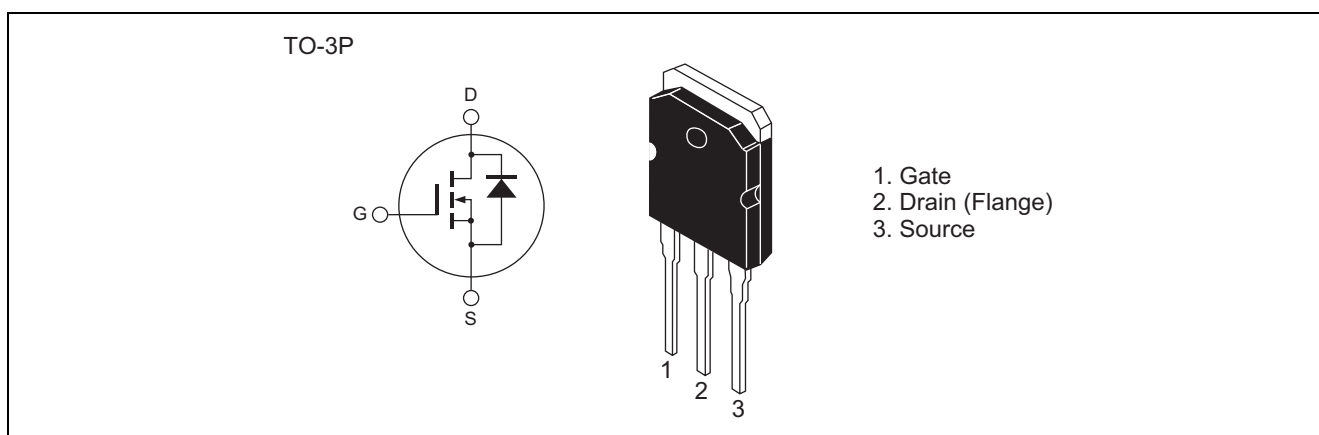
Rev.3.00

Nov.24.2004

Features

- Low on-resistance
- Low leakage current
- High speed switching

Outline



Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Ratings | Unit |
|---|----------------------------------|-------------|------|
| Drain to Source voltage | V_{DSS} | 200 | V |
| Gate to Source voltage | V_{GSS} | ± 30 | V |
| Drain current | I_D | 96 | A |
| Drain peak current | $I_{D(pulse)}$ ^{Note1} | 192 | A |
| Body-Drain diode reverse Drain current | I_{DR} | 96 | A |
| Body-Drain diode reverse Drain peak current | $I_{DR(pulse)}$ ^{Note1} | 192 | A |
| Avalanche current | I_{AP} ^{Note3} | 48 | A |
| Avalanche energy | E_{AR} ^{Note3} | 153 | mJ |
| Channel dissipation | P_{ch} ^{Note2} | 150 | W |
| Channel to case thermal impedance | θ_{ch-c} | 0.833 | °C/W |
| Channel temperature | T_{ch} | 150 | °C |
| Storage temperature | T_{stg} | -55 to +150 | °C |

Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$

2. Value at $T_c = 25^\circ C$

3. $ST_{ch} = 25^\circ C$, $T_{ch} \leq 150^\circ C$

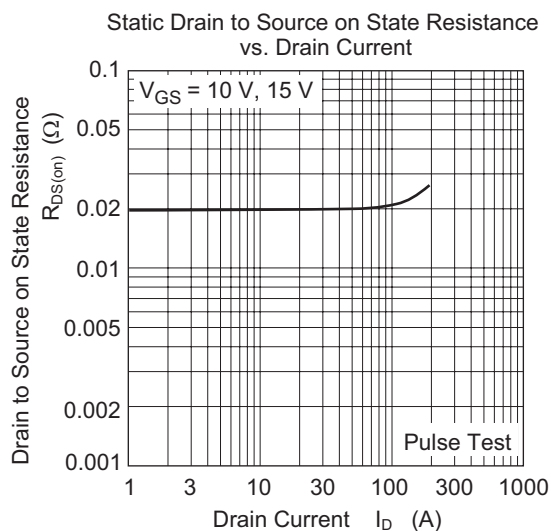
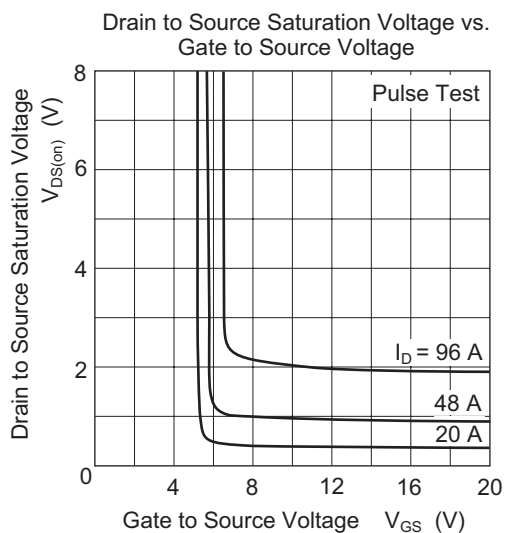
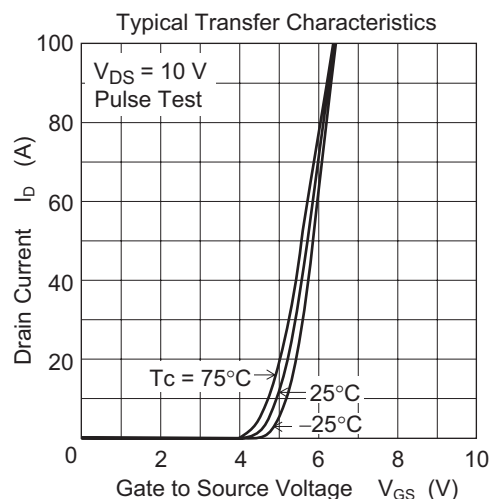
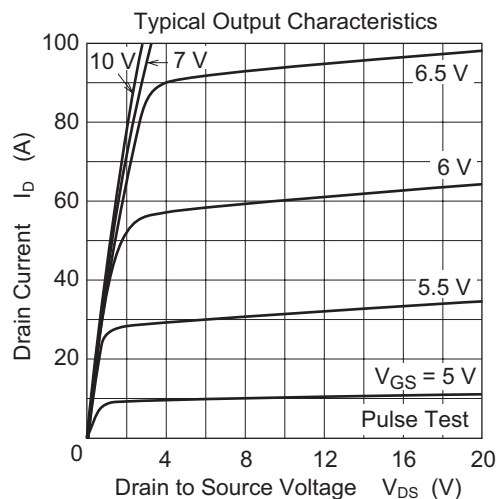
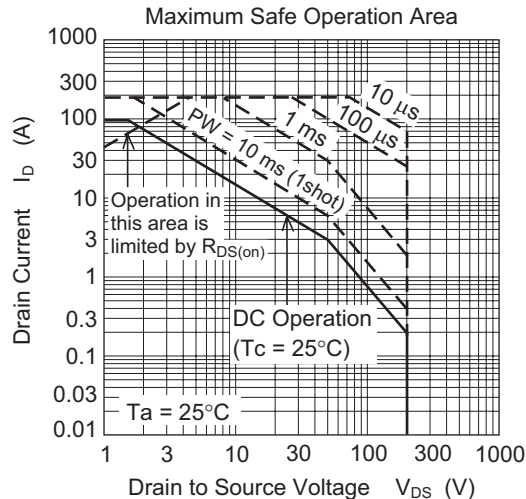
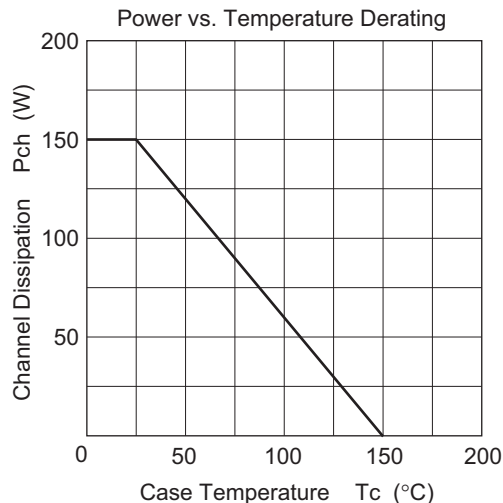
Electrical Characteristics

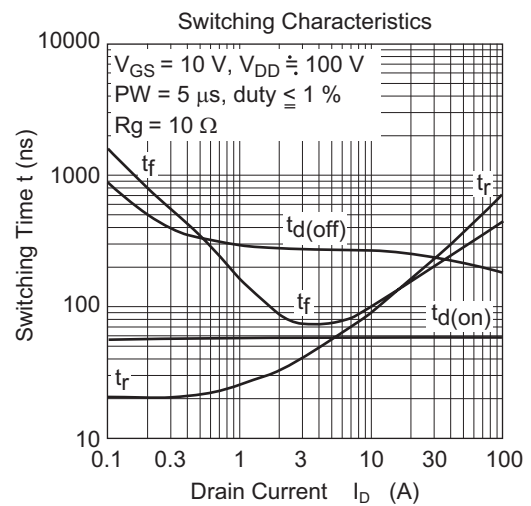
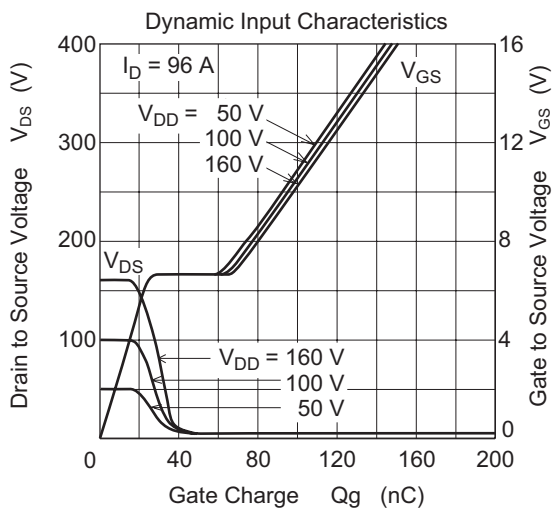
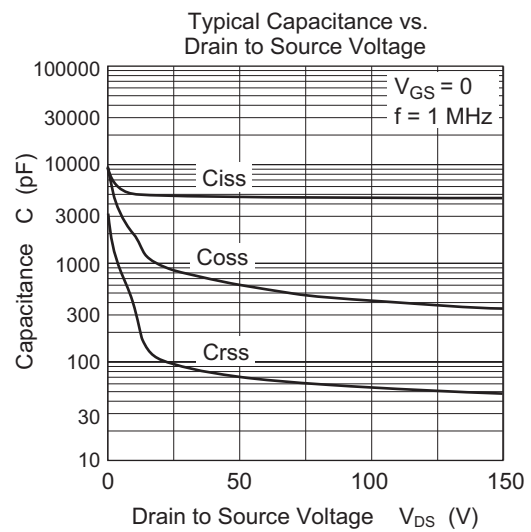
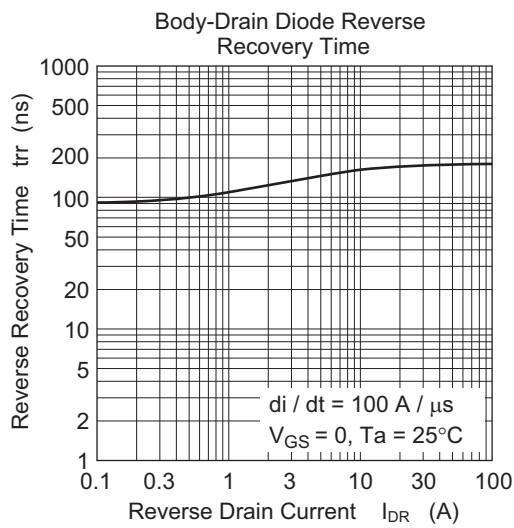
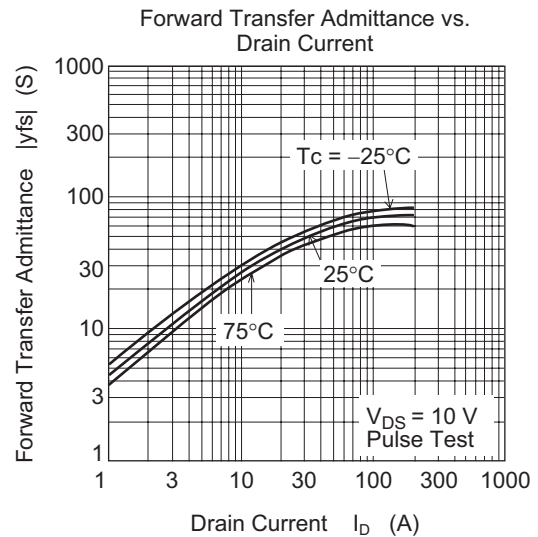
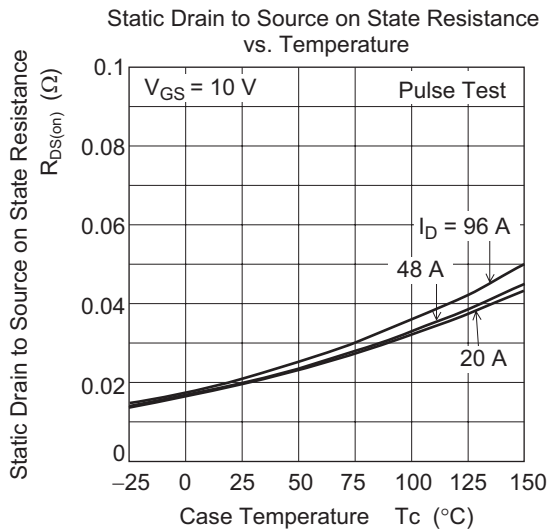
(Ta = 25°C)

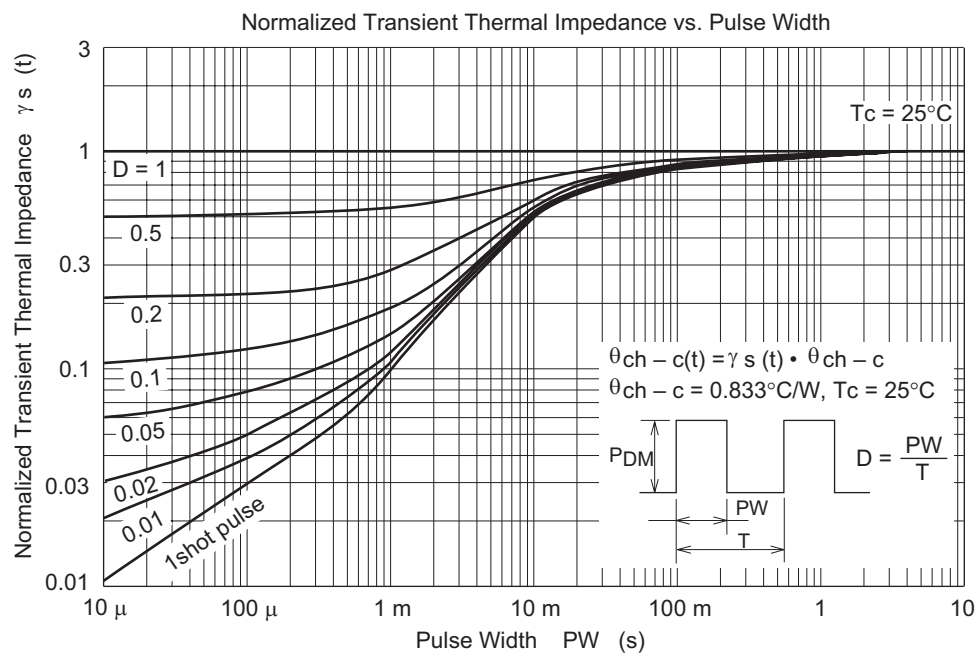
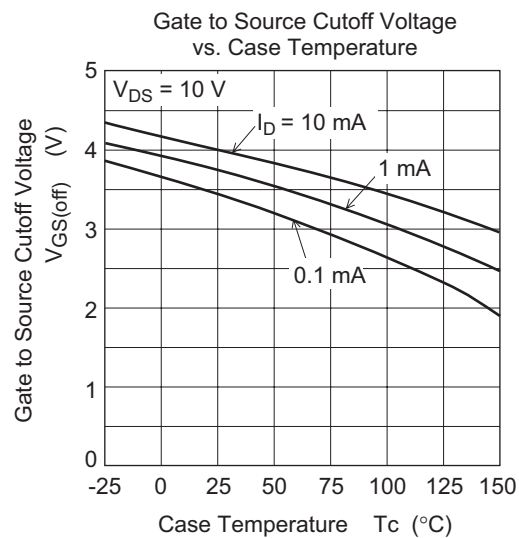
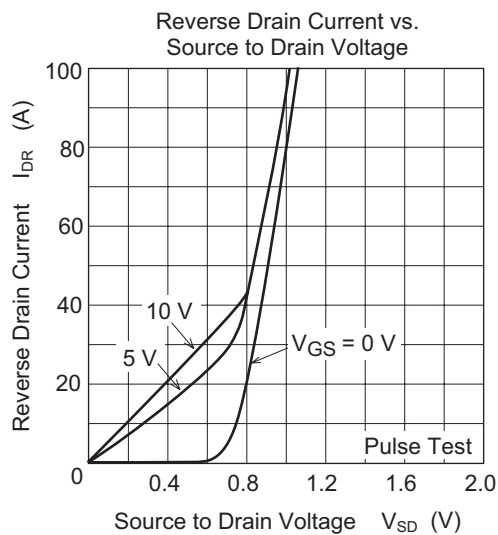
| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|--|---------------|-----|-------|-----------|---------------|--|
| Drain to Source breakdown voltage | $V_{(BR)DSS}$ | 200 | — | — | V | $I_D = 10 \text{ mA}$, $V_{GS} = 0$ |
| Zero Gate voltage Drain current | I_{DSS} | — | — | 1 | μA | $V_{DS} = 200 \text{ V}$, $V_{GS} = 0$ |
| Gate to Source leak current | I_{GSS} | — | — | ± 0.1 | μA | $V_{GS} = \pm 30 \text{ V}$, $V_{DS} = 0$ |
| Gate to Source cutoff voltage | $V_{GS(off)}$ | 3.0 | — | 4.5 | V | $V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$ |
| Forward transfer admittance | $ y_{fs} $ | 35 | 58 | — | S | $I_D = 48 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note4} |
| Static Drain to Source on state resistance | $R_{DS(on)}$ | — | 0.020 | 0.023 | Ω | $I_D = 48 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4} |
| Input capacitance | C_{iss} | — | 4900 | — | pF | $V_{DS} = 25 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$ |
| Output capacitance | C_{oss} | — | 850 | — | pF | |
| Reverse transfer capacitance | C_{rss} | — | 95 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 60 | — | ns | $I_D = 48 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 2.1 \Omega$ $R_g = 10 \Omega$ |
| Rise time | t_r | — | 370 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 220 | — | ns | |
| Fall time | t_f | — | 270 | — | ns | |
| Total Gate charge | Q_g | — | 98 | — | nC | $V_{DD} = 160 \text{ V}$ $V_{GS} = 10 \text{ V}$ $I_D = 96 \text{ A}$ |
| Gate to Source charge | Q_{gs} | — | 25 | — | nC | |
| Gate to Drain charge | Q_{gd} | — | 44 | — | nC | |
| Body-Drain diode forward voltage | V_{DF} | — | 1.1 | 1.7 | V | $I_F = 96 \text{ A}$, $V_{GS} = 0$ ^{Note4} |
| Body-Drain diode reverse recovery time | t_{rr} | — | 180 | — | ns | $I_F = 96 \text{ A}$, $V_{GS} = 0$ $diF/dt = 100 \text{ A}/\mu\text{s}$ |
| Body-Drain diode reverse recovery charge | Q_{rr} | — | 1.5 | — | μC | |

Notes: 4. Pulse test

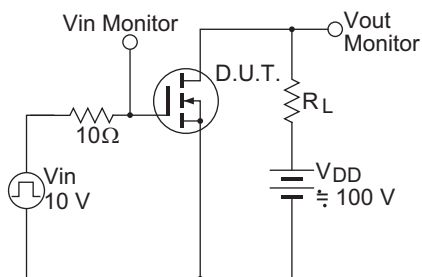
Main Characteristics



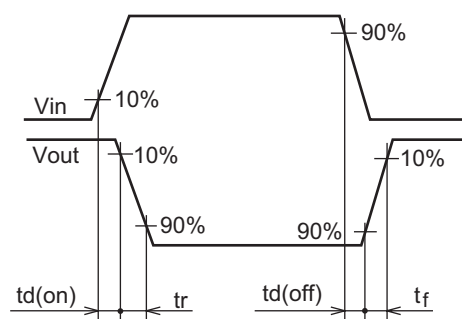




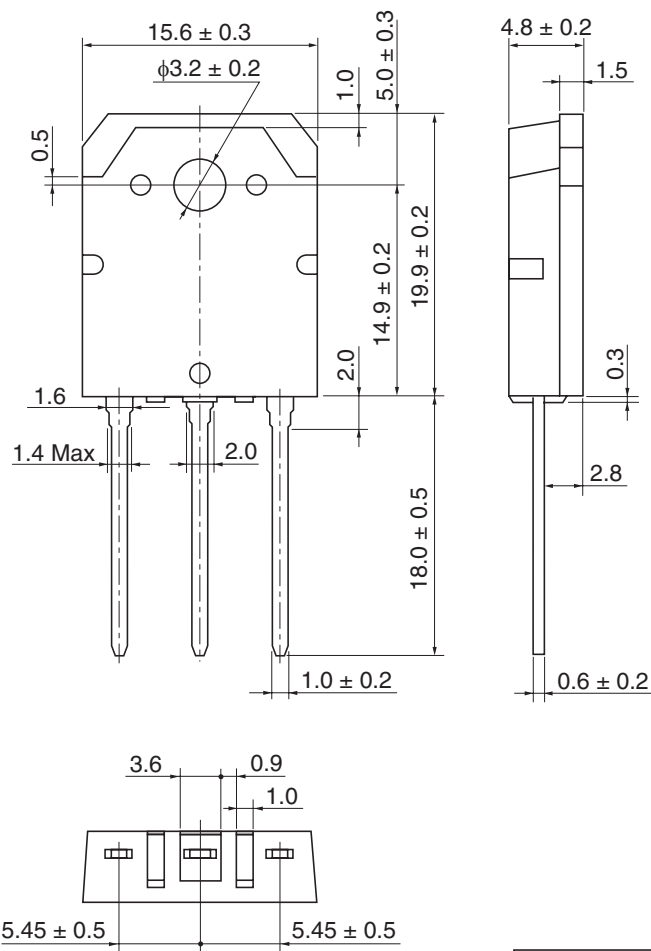
Switching Time Test Circuit



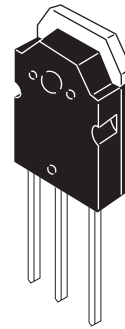
Waveform



Package Dimensions



As of January, 2003
Unit: mm



| | |
|------------------------|----------|
| Package Code | TO-3P |
| JEDEC | — |
| JEITA | Conforms |
| Mass (reference value) | 5.0 g |

Ordering Information

| Part Name | Quantity | Shipping Container |
|------------|----------|--------------------|
| H5N2008P-E | 30 pcs | Plastic magazine |

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