

## H5N2003P

Silicon N Channel MOS FET  
High Speed Power Switching

REJ03G0235-0100Z

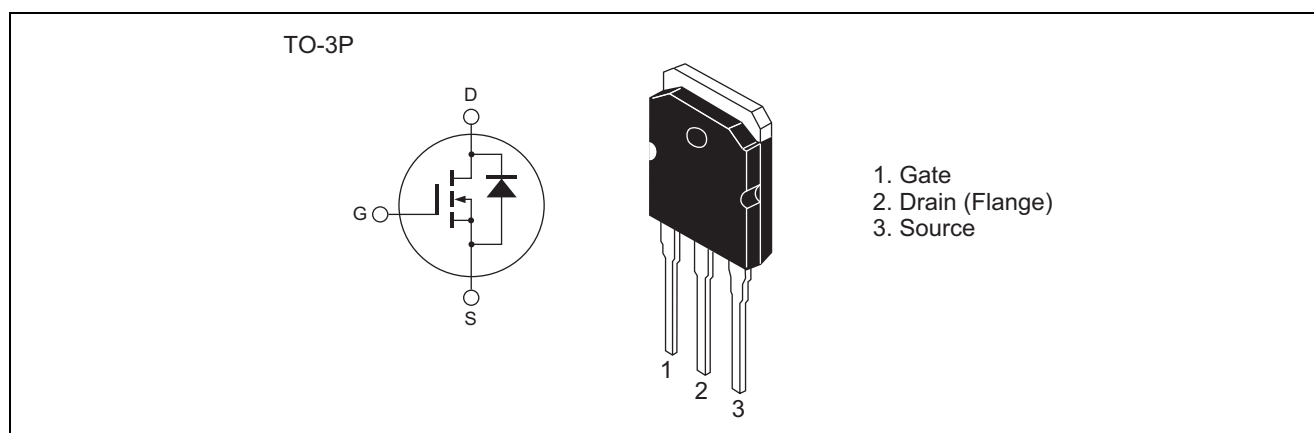
Rev.1.00

Apr.09.2004

### 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	$I_D$	60	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	240	A
Body-Drain diode reverse Drain current	$I_{DR}$	60	A
Body-Drain diode reverse Drain peak current	$I_{DR(pulse)}$ <sup>Note1</sup>	240	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	40	A
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	150	W
Channel to case thermal impedance	$\theta_{ch-c}$	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.  $T_{ch} \leq 150^\circ C$

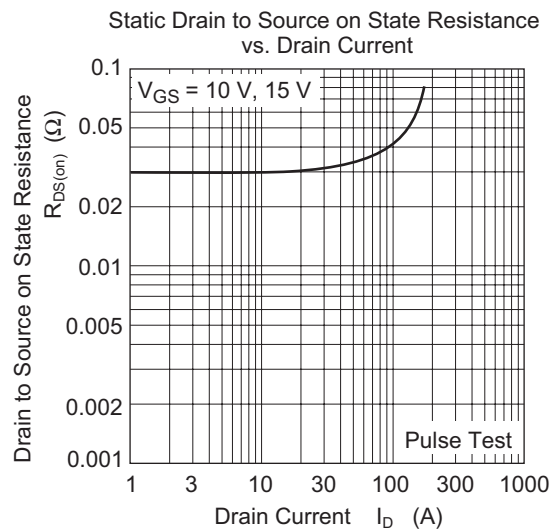
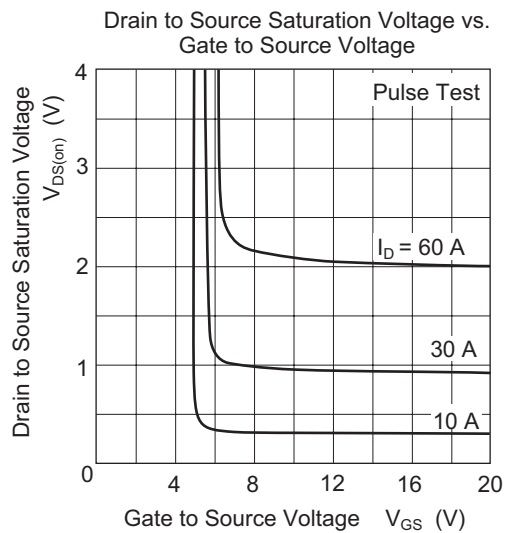
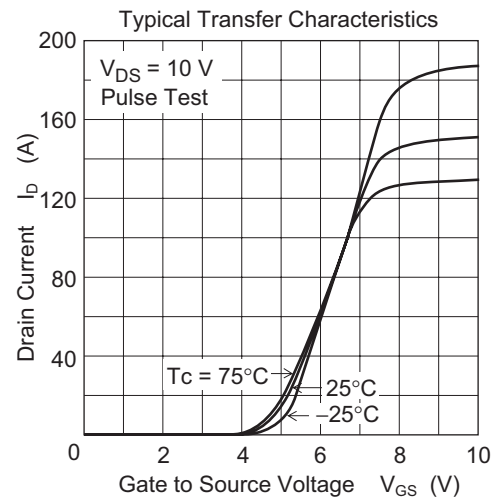
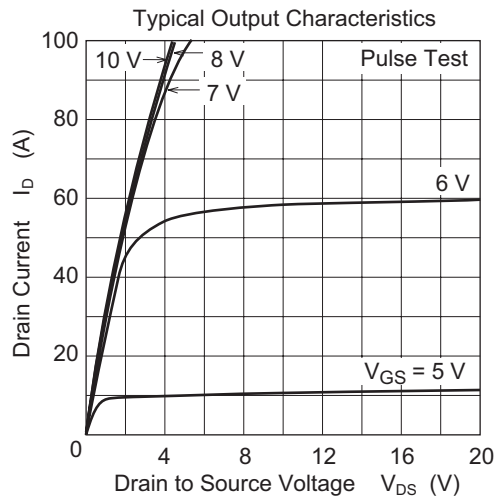
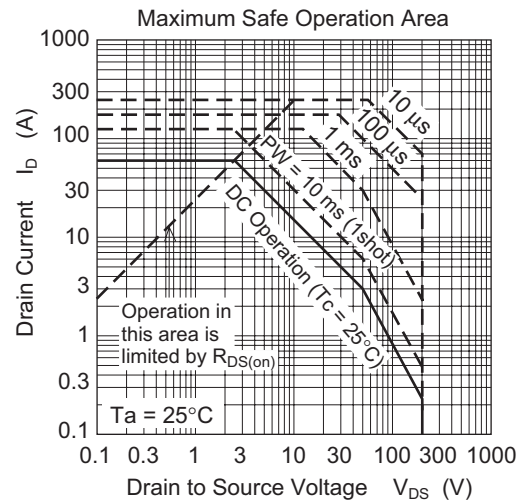
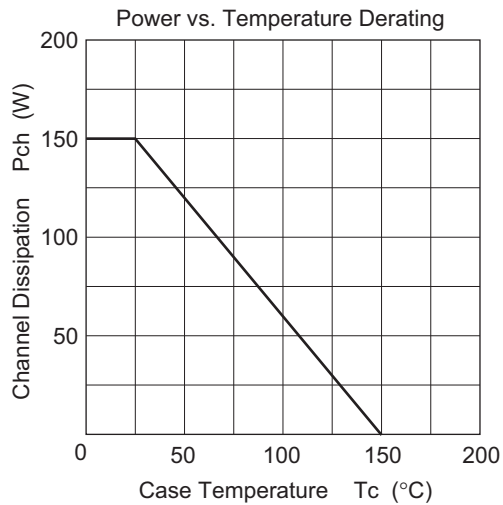
## Electrical Characteristics

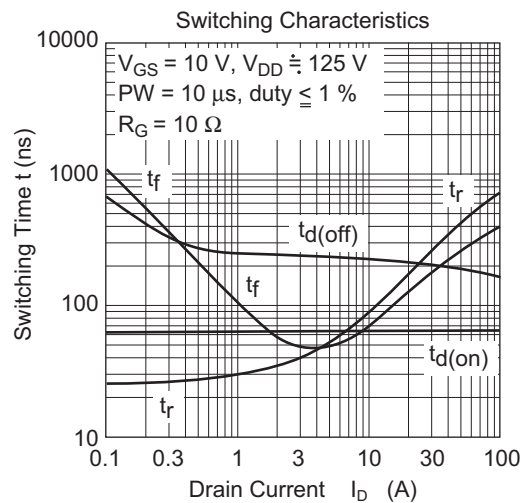
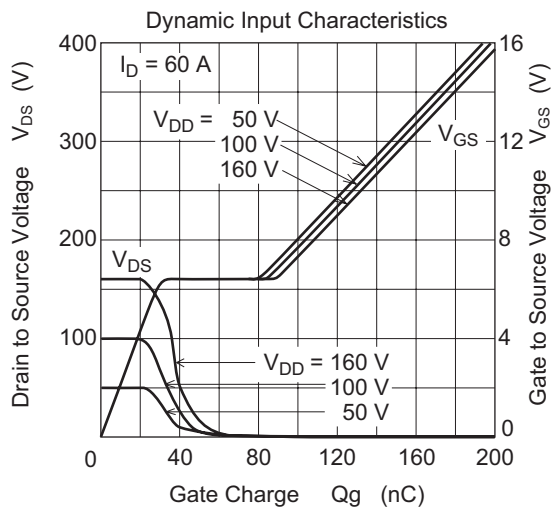
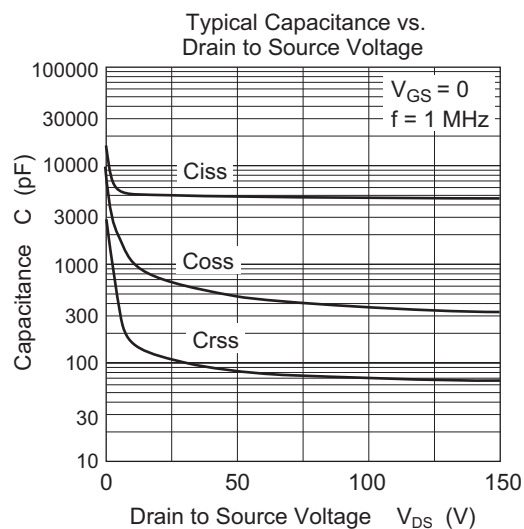
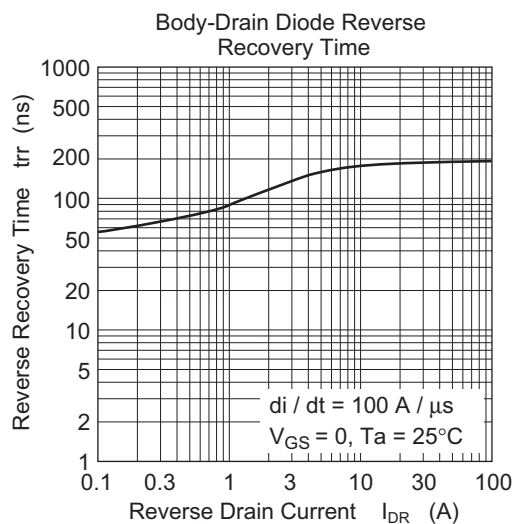
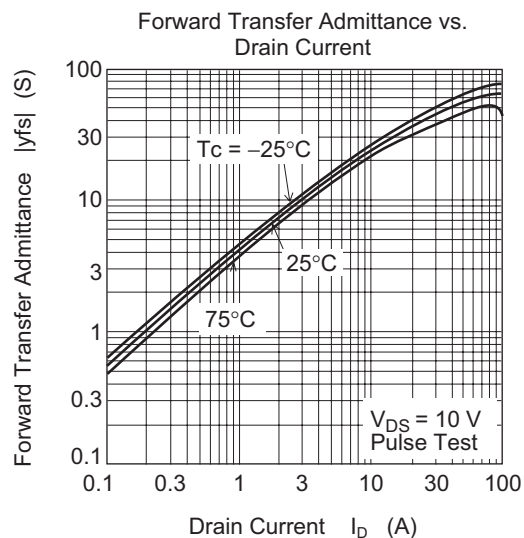
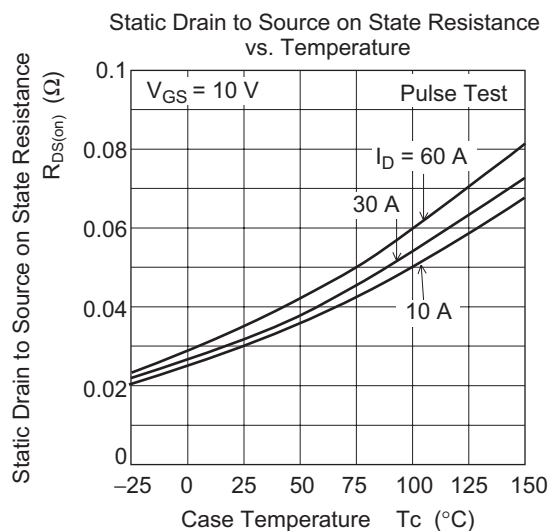
(Ta = 25°C)

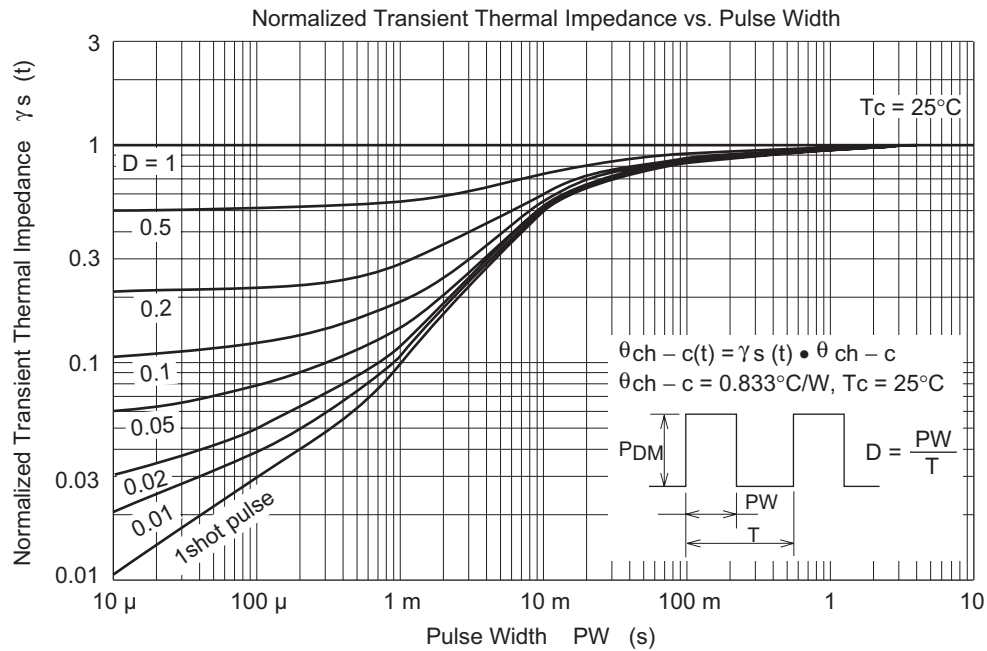
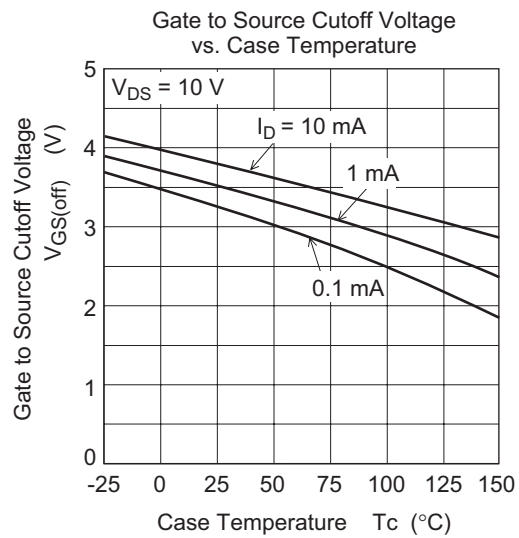
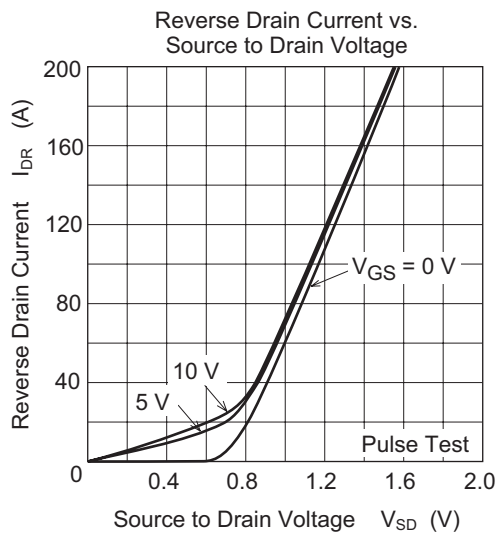
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to Source breakdown voltage	$V_{(BR)DSS}$	200	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Zero Gate voltage drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 200 \text{ V}$ , $V_{GS} = 0$
Gate to Source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0$
Gate to Source cutoff voltage	$V_{GS(off)}$	3.0	—	4.0	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Forward transfer admittance	$ y_{fs} $	26	44	—	S	$I_D = 30 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note4</sup>
Static Drain to Source on state resistance	$R_{DS(on)}$	—	0.032	0.042	$\Omega$	$I_D = 30 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	5150	—	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	$C_{oss}$	—	660	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	110	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	65	—	ns	$I_D = 30 \text{ A}$
Rise time	$t_r$	—	260	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	200	—	ns	$R_L = 3.33 \Omega$
Fall time	$t_f$	—	180	—	ns	$R_g = 10 \Omega$
Total Gate charge	$Q_g$	—	132	—	nC	$V_{DD} = 160 \text{ V}$
Gate to Source charge	$Q_{gs}$	—	30	—	nC	$V_{GS} = 10 \text{ V}$
Gate to Drain charge	$Q_{gd}$	—	60	—	nC	$I_D = 60 \text{ A}$
Body-Drain diode forward voltage	$V_{DF}$	—	1.0	1.5	V	$I_F = 60 \text{ A}$ , $V_{GS} = 0$ <sup>Note4</sup>
Body-Drain diode reverse recovery time	$t_{rr}$	—	190	—	ns	$I_F = 60 \text{ A}$ , $V_{GS} = 0$
Body-Drain diode reverse recovery charge	$Q_{rr}$	—	1.4	—	$\mu\text{C}$	$diF/dt = 100 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

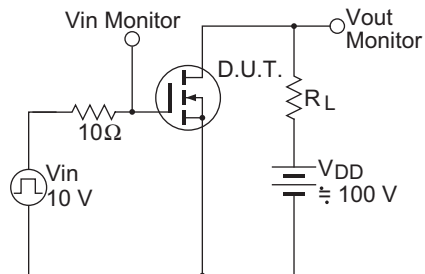
## Main Characteristics



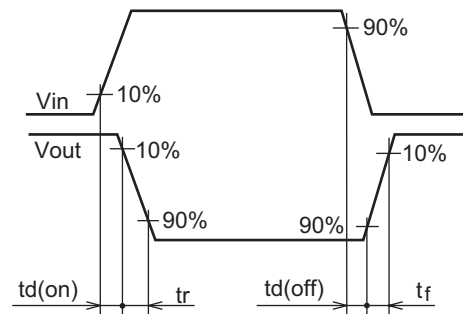




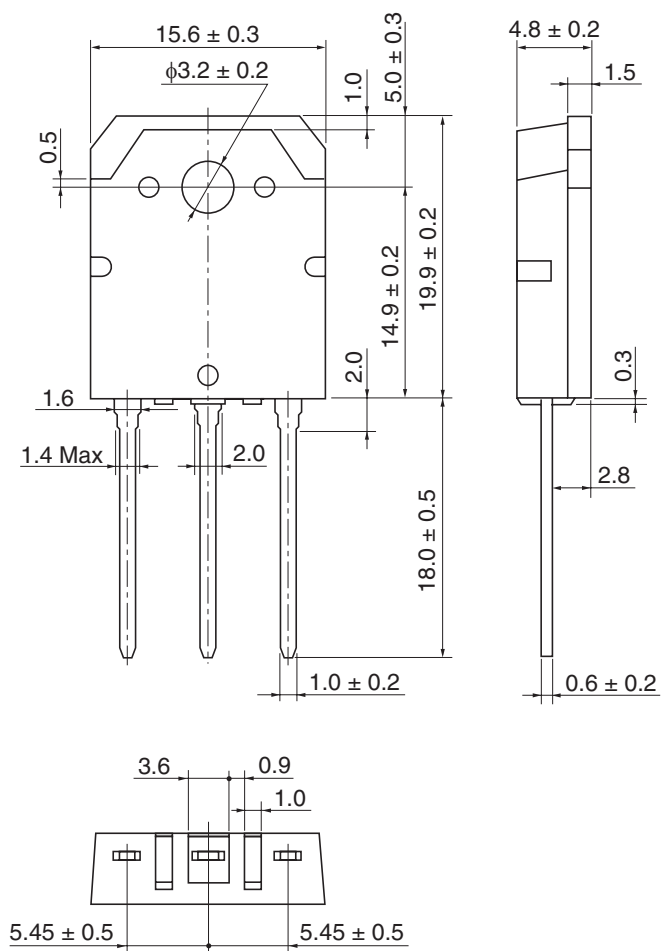
Switching Time Test Circuit



Waveform

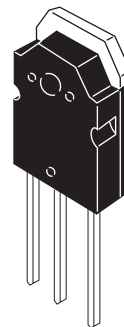


## Package Dimensions



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
H5N2003P-E	30 pcs	Plastic magazine

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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