

H5N3011P

Silicon N Channel MOS FET
High Speed Power Switching

REJ03G0385-0200

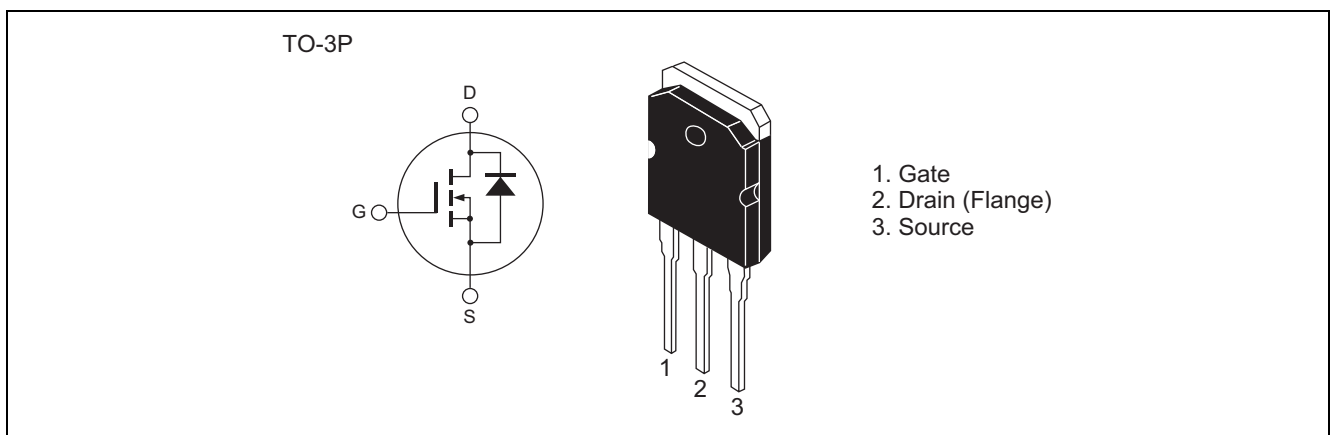
Rev.2.00

Aug.05.2004

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}	300	V
Gate to Source voltage	V_{GSS}	± 30	V
Drain current	I_D	88	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	176	A
Body-Drain diode reverse Drain current	I_{DR}	88	A
Body-Drain diode reverse Drain peak current	$I_{DR(pulse)}$ ^{Note1}	176	A
Avalanche current	I_{AP} ^{Note3}	30	A
Avalanche energy	E_{AR} ^{Note3}	54	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. $ST_{ch} = 25^\circ C$, $T_{ch} \leq 150^\circ C$

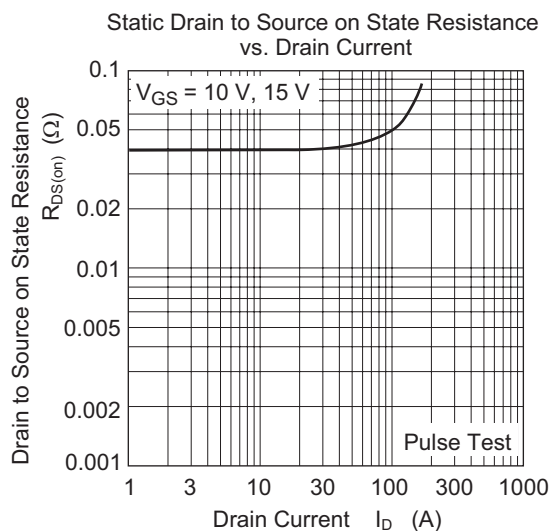
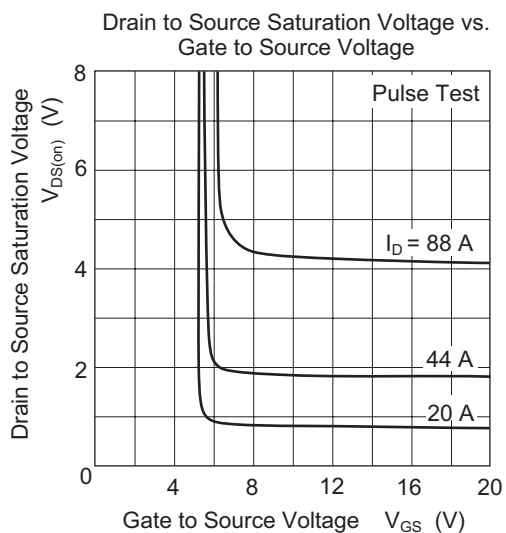
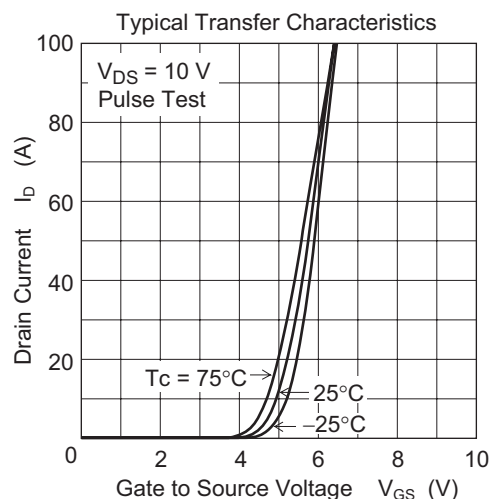
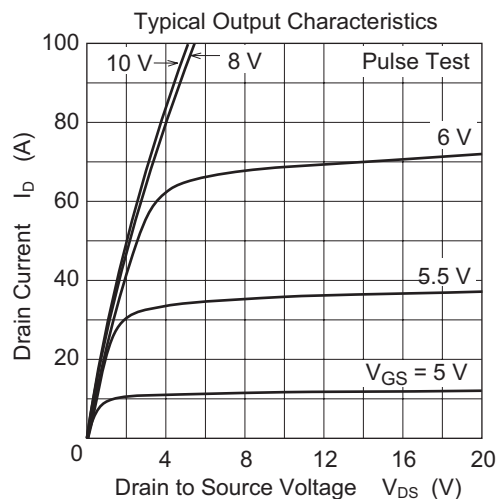
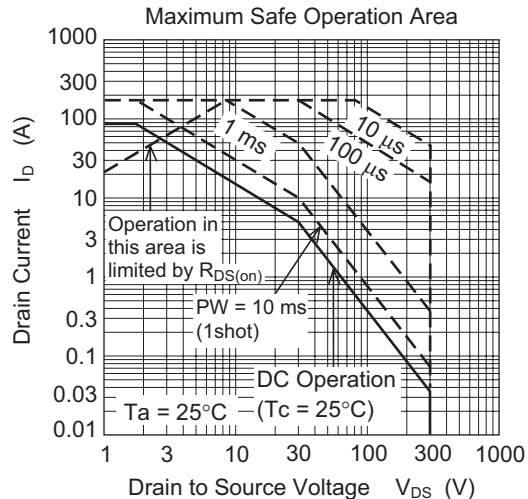
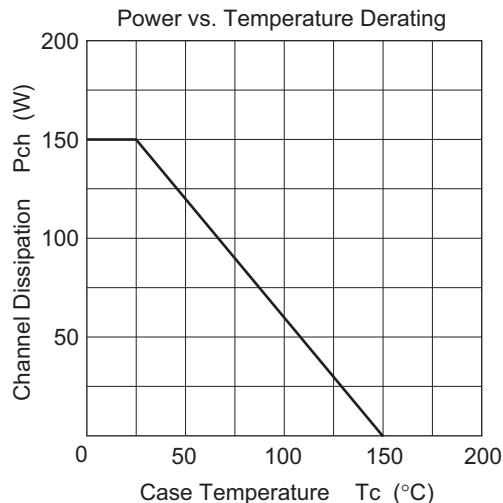
Electrical Characteristics

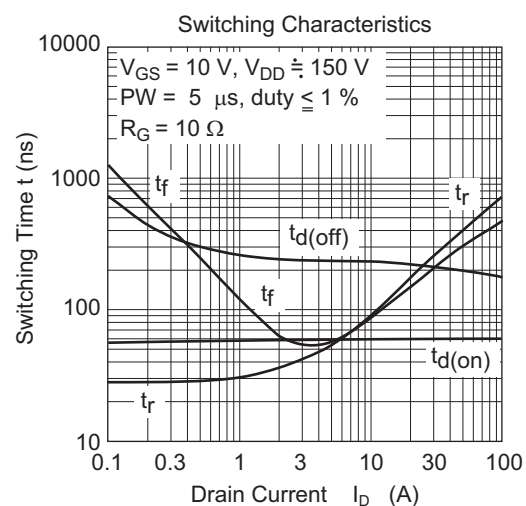
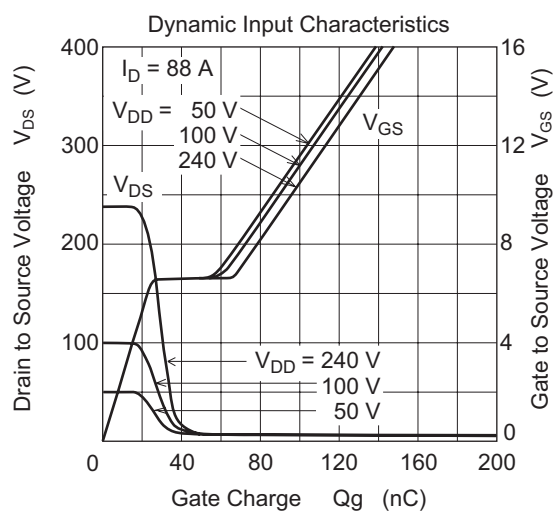
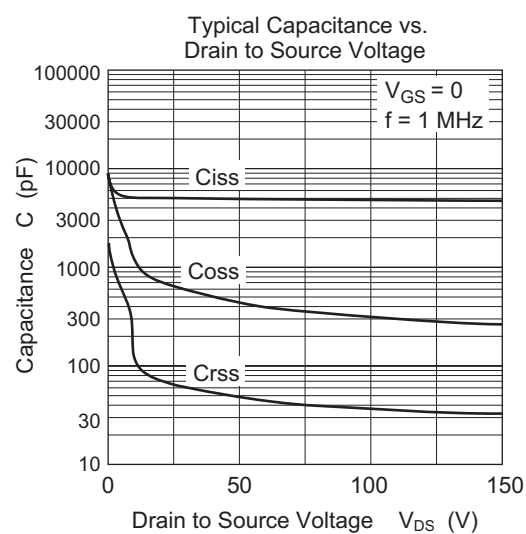
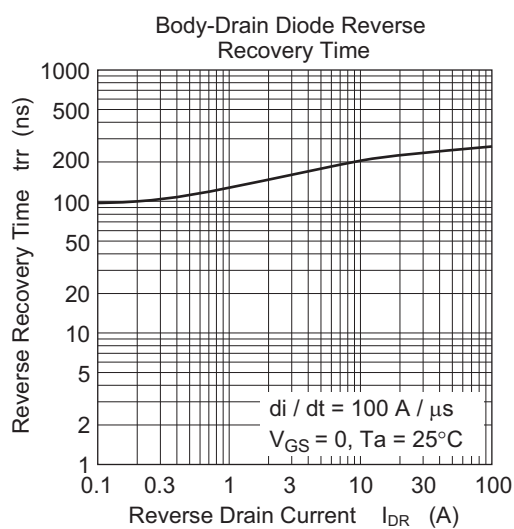
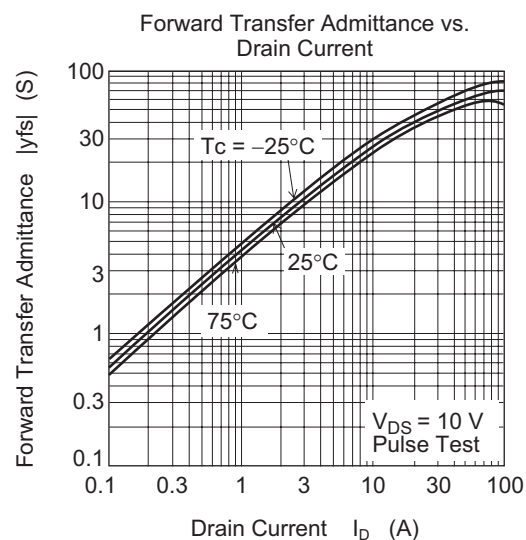
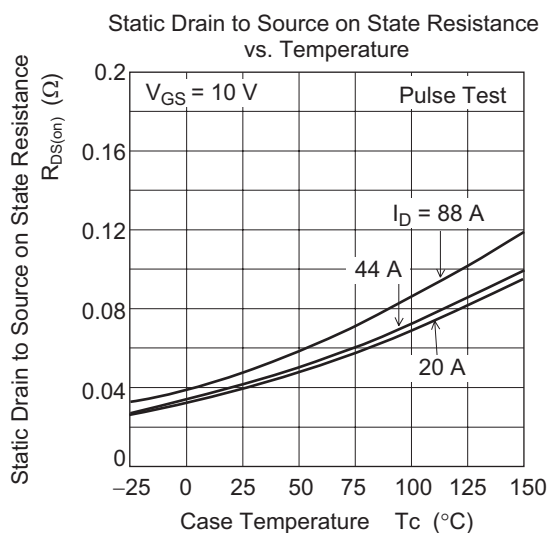
(Ta = 25°C)

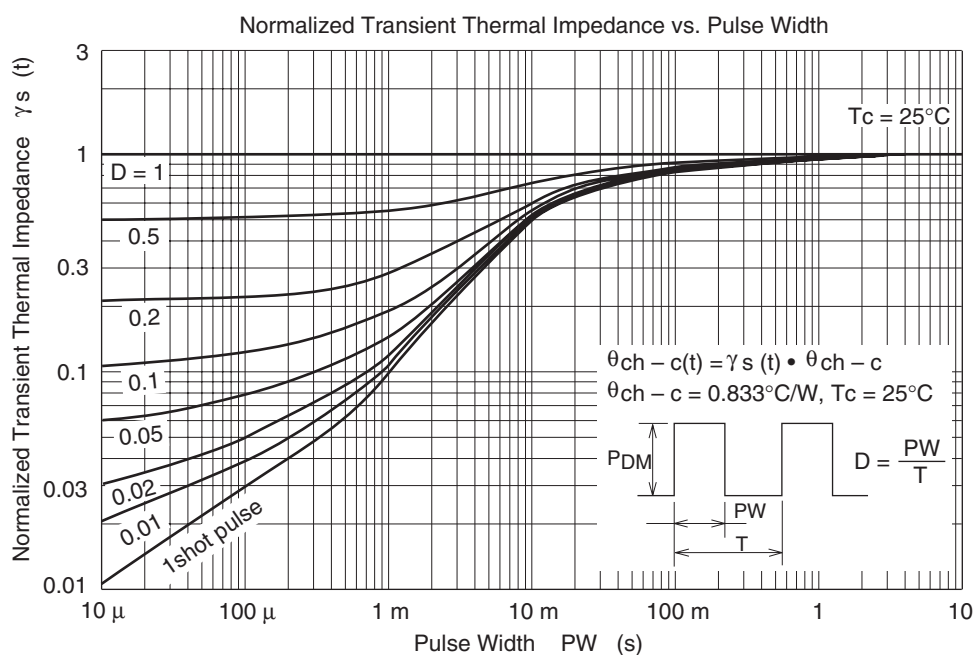
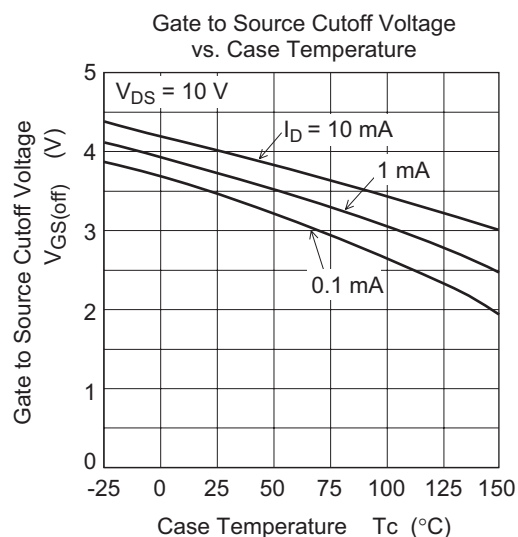
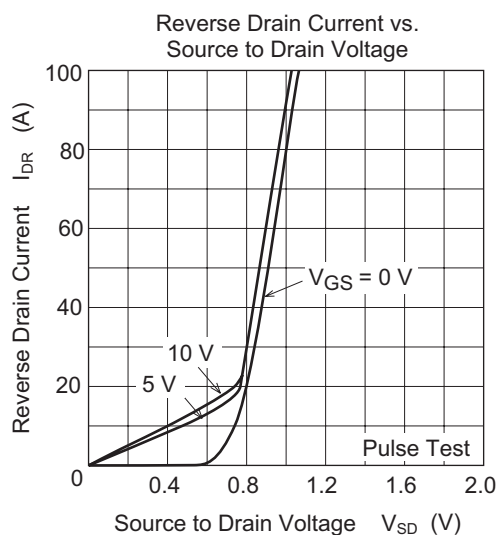
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to Source breakdown voltage	$V_{(BR)DSS}$	300	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Zero Gate voltage Drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 300 \text{ V}$, $V_{GS} = 0$
Gate to Source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 30 \text{ V}$, $V_{DS} = 0$
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} $	33	56	—	S	$I_D = 44 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note4}
Static Drain to Source on state resistance	$R_{DS(on)}$	—	0.042	0.048	Ω	$I_D = 44 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4}
Input capacitance	C_{iss}	—	5000	—	pF	$V_{DS} = 25 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	640	—	pF	
Reverse transfer capacitance	C_{rss}	—	65	—	pF	
Turn-on delay time	$t_{d(on)}$	—	60	—	ns	$I_D = 44 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 3.4 \Omega$ $R_g = 10 \Omega$
Rise time	t_r	—	370	—	ns	
Turn-off delay time	$t_{d(off)}$	—	200	—	ns	
Fall time	t_f	—	280	—	ns	
Total Gate charge	Q_g	—	95	—	nC	$V_{DD} = 240 \text{ V}$ $V_{GS} = 10 \text{ V}$ $I_D = 88 \text{ A}$
Gate to Source charge	Q_{gs}	—	25	—	nC	
Gate to Drain charge	Q_{gd}	—	40	—	nC	
Body-Drain diode forward voltage	V_{DF}	—	1.0	1.5	V	$I_F = 88 \text{ A}$, $V_{GS} = 0$ ^{Note4}
Body-Drain diode reverse recovery time	t_{rr}	—	260	—	ns	$I_F = 88 \text{ A}$, $V_{GS} = 0$ $diF/dt = 100 \text{ A}/\mu\text{s}$
Body-Drain diode reverse recovery charge	Q_{rr}	—	2.5	—	μC	

Notes: 4. Pulse test

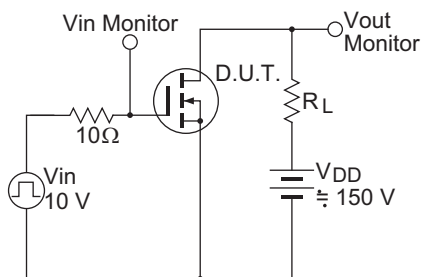
Main Characteristics



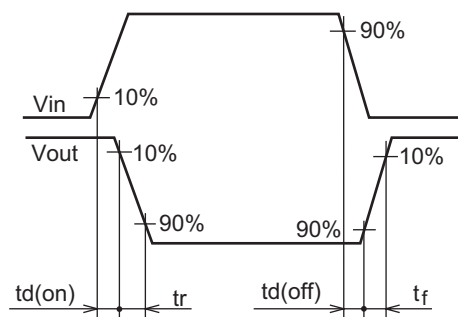




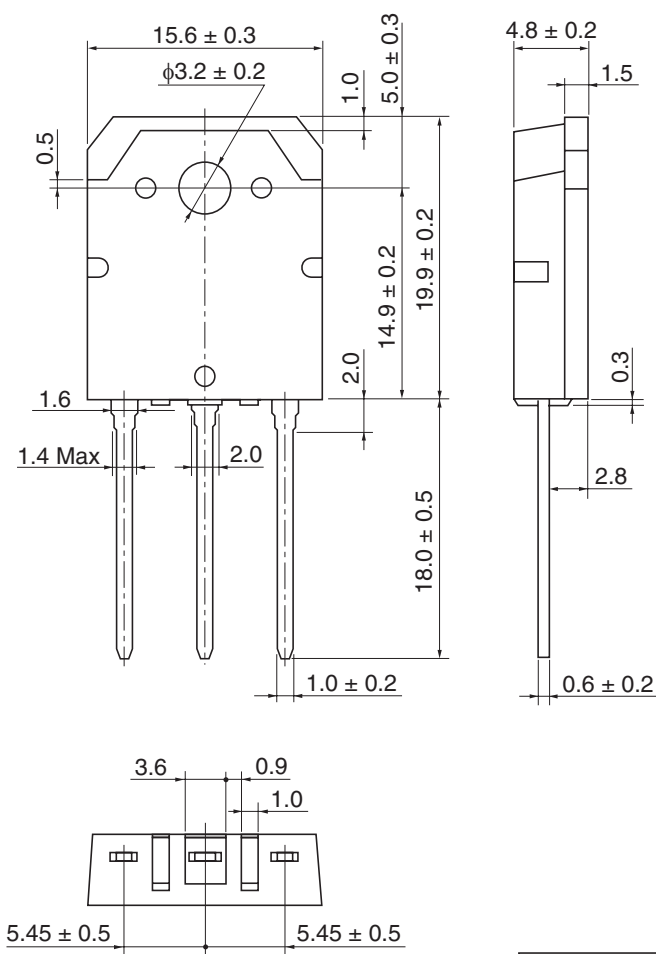
Switching Time Test Circuit



Waveform

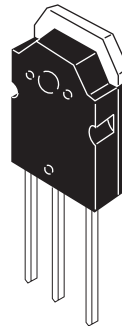


Package Dimensions



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
H5N3011P-E	30 pcs	Plastic magazine

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