H5N3004P

Silicon N Channel MOS FET
High Speed Power Switching

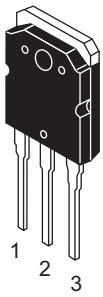
REJ03G1111-0100
(Previous: ADE-208-1523)
Rev.1.00
Sep 07, 2005

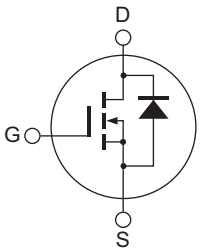
Features

- Low on-resistance
- Low leakage current
- High speed switching
- Low gate charge (Qg)
- Avalanche ratings

Outline

RENESAS Package code: PRSS0004ZE-A
(Package name: TO-3P)





1. Gate
2. Drain (Flange)
3. Source

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V_{DSS}	300	V
Gate to source voltage	V_{GSS}	±30	V
Drain current	I_D	25	A
Drain peak current	$I_{D\ (pulse)}$ Note 1	100	A
Body-drain diode reverse drain current	I_{DR}	25	A
Body-drain diode reverse drain peak current	$I_{DR\ (pulse)}$ Note 1	100	A
Avalanche current	I_{AP} Note 3	25	A
Channel dissipation	Pch Note 2	150	W
Channel to case thermal Impedance	θ ch-c	0.833	°C/W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1%
2. Value at Tc = 25°C
3. Tch ≤ 150°C

Electrical Characteristics

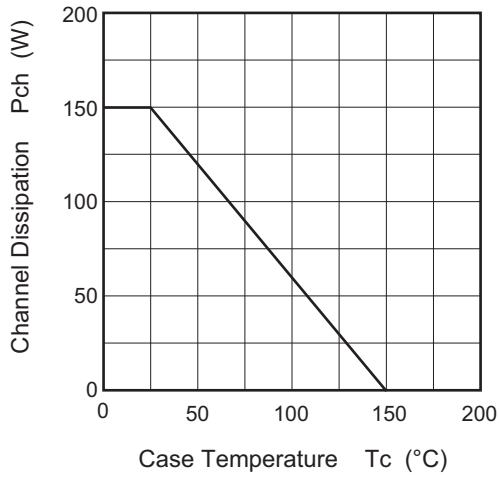
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)\ DSS}$	300	—	—	V	I_D = 10 mA, V_{GS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	µA	V_{DS} = 300 V, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	±0.1	µA	V_{GS} = ±30 V, V_{DS} = 0
Gate to source cutoff voltage	$V_{GS\ (off)}$	3.0	—	4.0	V	V_{DS} = 10 V, I_D = 1 mA
Forward transfer admittance	$\|y_{fs}\|$	15	25	—	S	I_D = 12.5 A, V_{DS} = 10 V Note 4
Static drain to source on state resistance	$R_{DS\ (on)}$	—	0.076	0.093	Ω	I_D = 12.5 A, V_{GS} = 10 V Note 4
Input capacitance	Ciss	—	3600	—	pF	V_{DS} = 25 V
Output capacitance	Coss	—	400	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	100	—	pF	f = 1 MHz
Turn-on delay time	$t_{d\ (on)}$	—	50	—	ns	I_D = 12.5 A
Rise time	t_r	—	120	—	ns	R_L = 12 Ω
Turn-off delay time	$t_{d\ (off)}$	—	180	—	ns	V_{GS} = 10 V
Fall time	t_f	—	90	—	ns	Rg = 10 Ω
Total gate charge	Qg	—	110	—	nC	V_{DD} = 240 V
Gate to source charge	Qgs	—	18	—	nC	V_{GS} = 10 V
Gate to drain charge	Qgd	—	55	—	nC	I_D = 25 A
Body-drain diode forward voltage	V_{DF}	—	0.9	1.35	V	I_F = 25 A, V_{GS} = 0
Body-drain diode reverse recovery time	t_{rr}	—	250	—	ns	I_F = 25 A, V_{GS} = 0
Body-drain diode reverse recovery charge	Q_{rr}	—	2.3	—	µC	di_F/dt = 100 A/µs

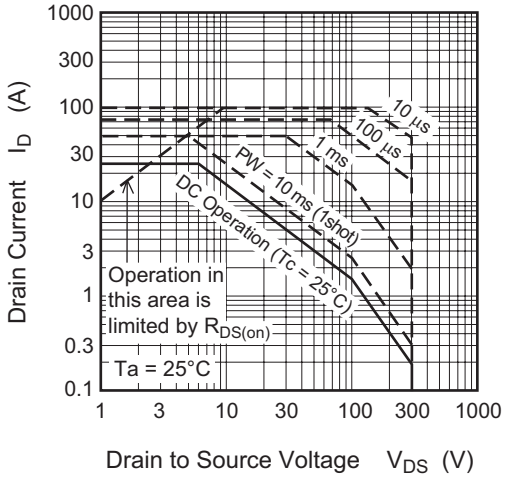
Note: 4. Pulse test

Main Characteristics

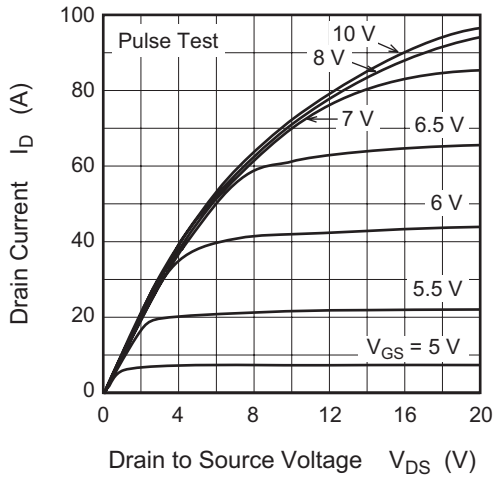
Power vs. Temperature Derating



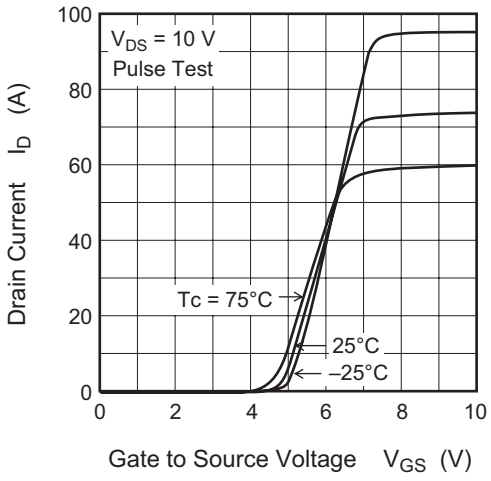
Maximum Safe Operation Area



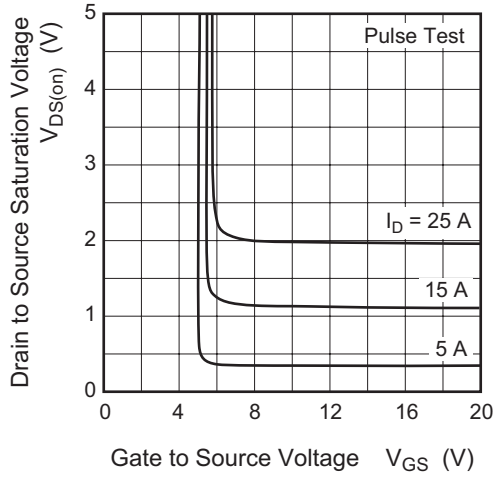
Typical Output Characteristics



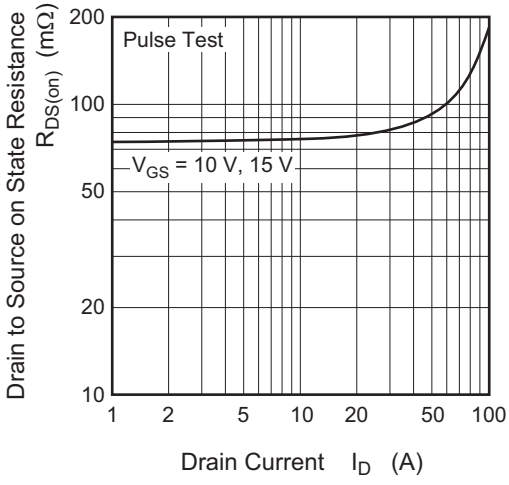
Typical Transfer Characteristics



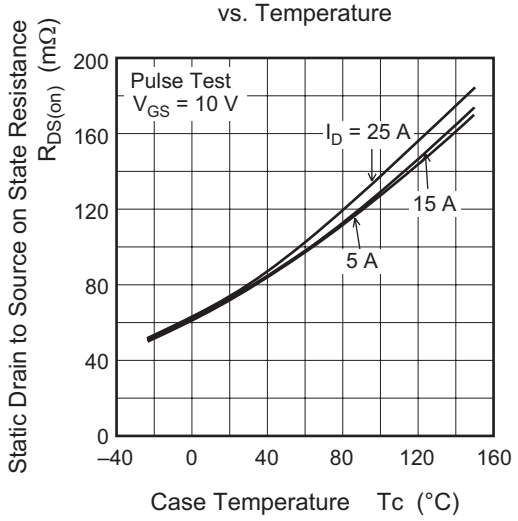
Drain to Source Saturation Voltage vs. Gate to Source Voltage



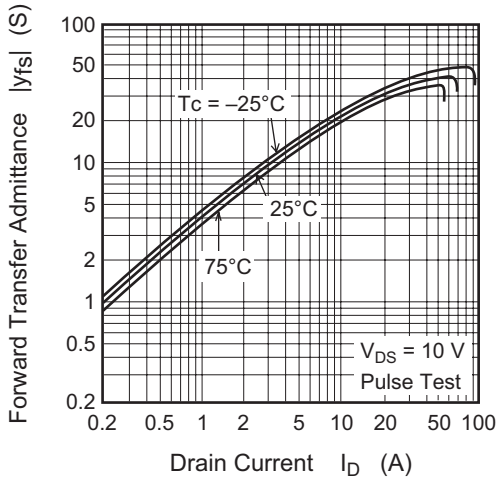
Static Drain to Source on State Resistance vs. Drain Current



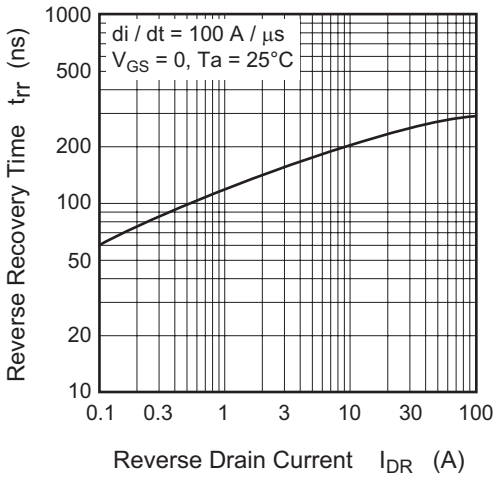
Static Drain to Source on State Resistance vs. Temperature



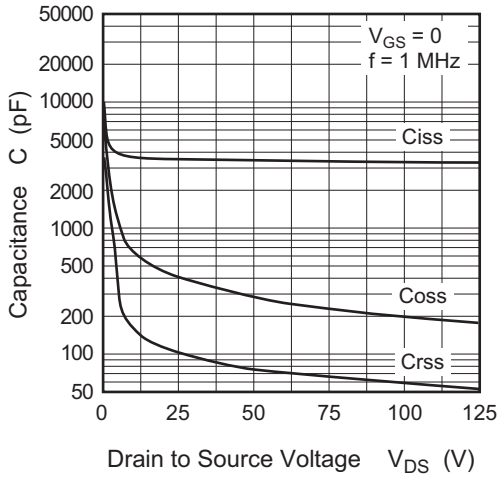
Forward Transfer Admittance vs. Drain Current



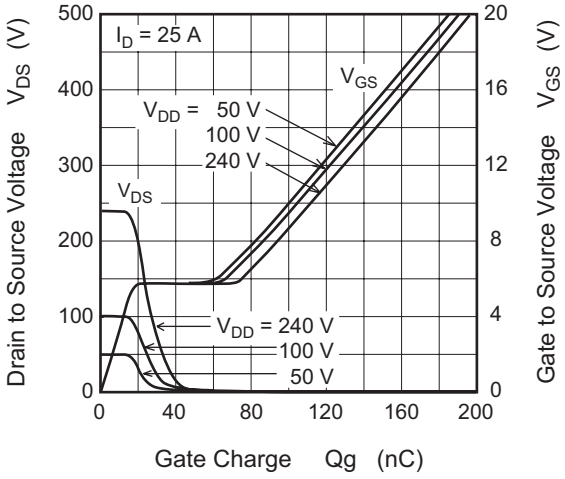
Body-Drain Diode Reverse Recovery Time



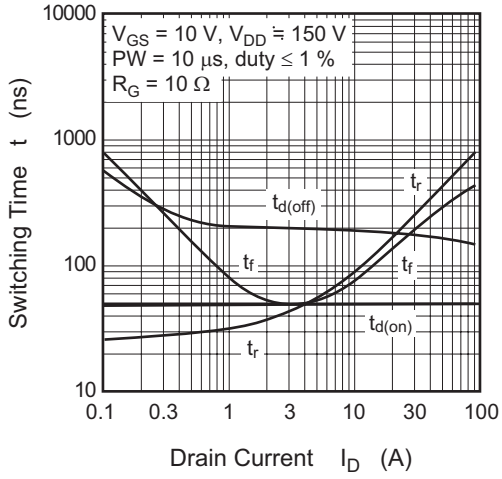
Typical Capacitance vs. Drain to Source Voltage



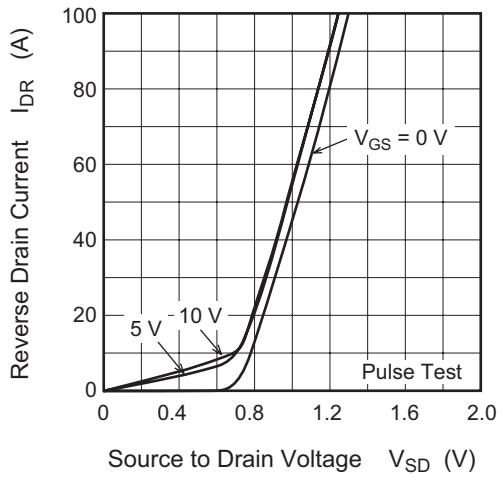
Dynamic Input Characteristics



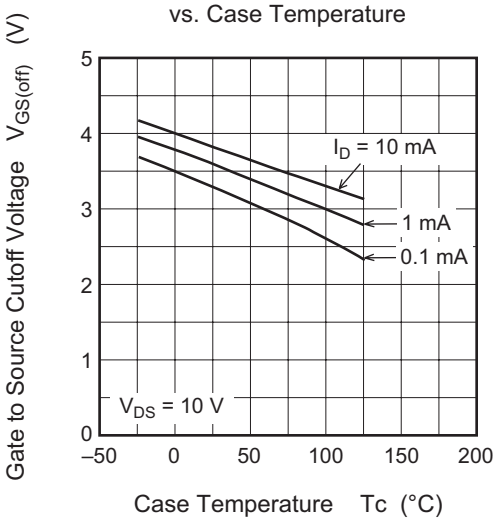
Switching Characteristics



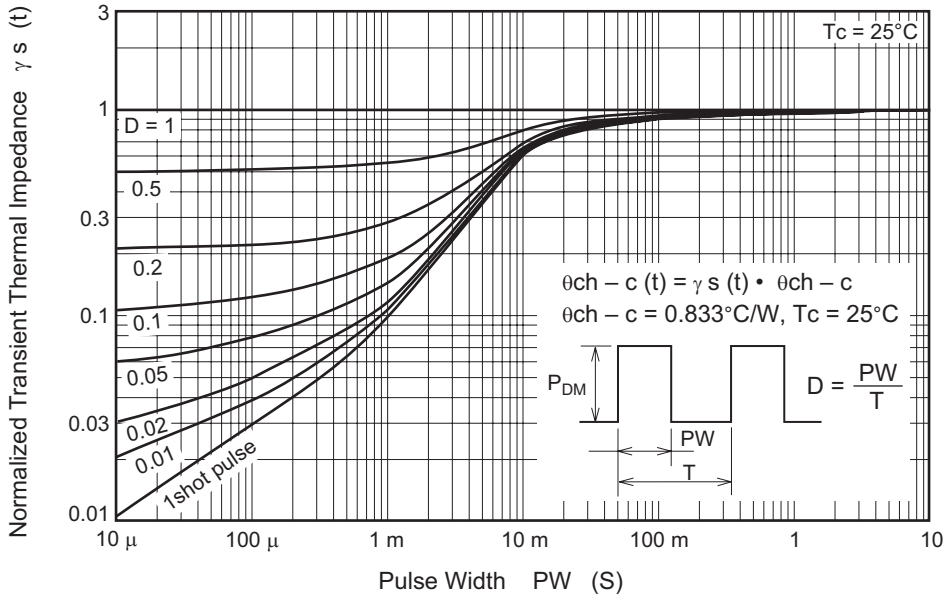
Reverse Drain Current vs. Source to Drain Voltage



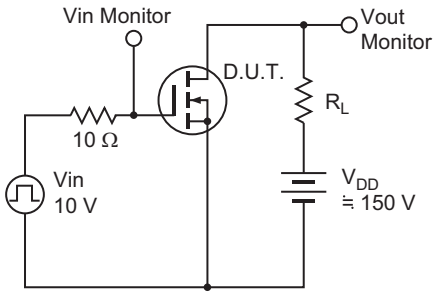
Gate to Source Cutoff Voltage vs. Case Temperature



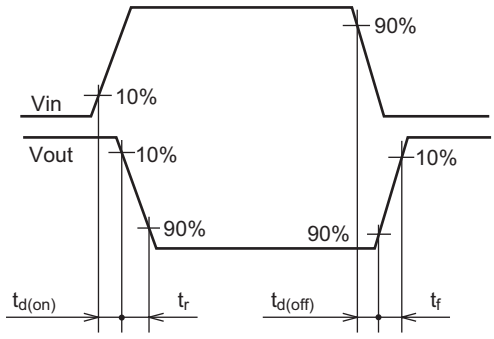
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



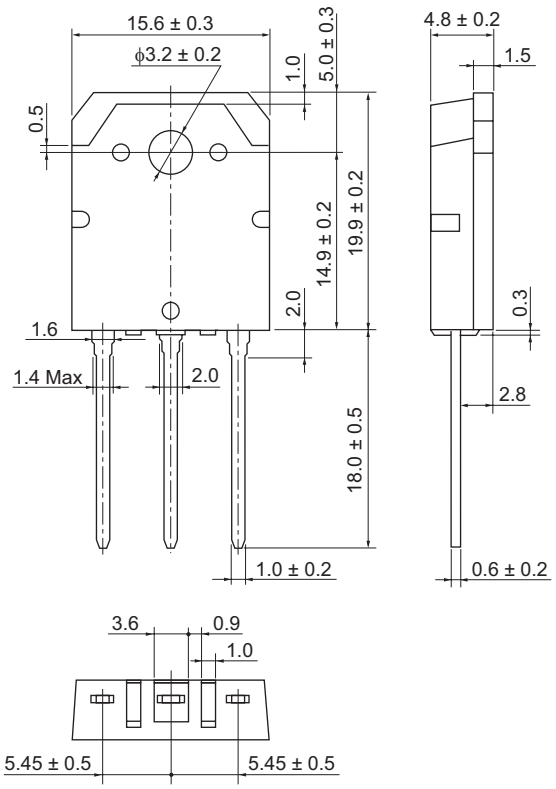
Waveform



Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]
SC-65	PRSS0004ZE-A	TO-3P / TO-3PV	5.0g

Unit: mm



Ordering Information

Part Name	Quantity	Shipping Container
H5N3004P-E	360 pcs	Box (Tube)

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