To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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H5N2522FN

Silicon N Channel MOS FET
High Speed Power Switching

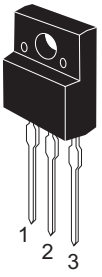
REJ03G1573-0210
Rev.2.10
May 08, 2007

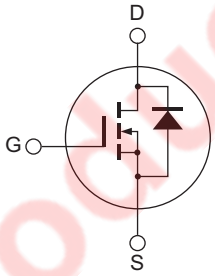
Features

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

Outline

RENESAS Package code: PRSS0003AB-A
(Package name: TO-220FN)





1. Gate
2. Drain
3. Source

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to Source voltage	V_{DSS}	250	V
Gate to source voltage	V_{GSS}	±30	V
Drain current	I_D	12	A
Drain peak current	$I_{D\ (pulse)}$ Note1	48	A
Body-Drain diode reverse Drain current	I_{DR}	12	A
Body-Drain diode reverse Drain peak current	$I_{DR\ (pulse)}$ Note1	48	A
Avalanche current	I_{AP} Note3	12	A
Avalanche energy	E_{AR} Note3	9	mJ
Channel dissipation	Pch Note2	35	W
Channel to case thermal impedance	θch-c	3.57	°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. STch = 25°C, Tch ≤ 150°C

Electrical Characteristics

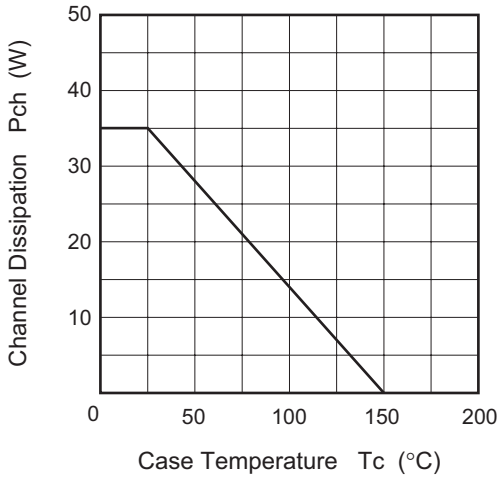
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to Source breakdown voltage	$V_{(BR)DSS}$	250	—	—	V	I_D = 10 mA, V_{GS} = 0
Zero Gate voltage drain current	I_{DSS}	—	—	10	µA	V_{DS} = 250 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	$V_{GS(off)}$	1.5	—	4.0	V	V_{DS} = 10 V, I_D = 1 mA
Static Drain to Source on state resistance	$R_{DS(on)}$	—	0.13	0.17	Ω	I_D = 6 A, V_{GS} = 10 V
Input capacitance	Ciss	—	1300	—	pF	V_{DS} = 25 V V_{GS} = 0 f = 1 MHz
Output capacitance	Coss	—	185	—	pF	
Reverse transfer capacitance	Crss	—	62	—	pF	
Turn-on delay time	$t_{d(on)}$	—	24	—	ns	I_D = 6 A V_{GS} = 10 V R_L = 20 Ω Rg = 10 Ω
Rise time	t_r	—	57	—	ns	
Turn-off delay time	$t_{d(off)}$	—	190	—	ns	
Fall time	t_f	—	69	—	ns	
Body-Drain diode forward voltage	V_{DF}	—	0.89	1.35	V	I_F = 12 A, V_{GS} = 0
Body-Drain diode reverse recovery time	t_{rr}	—	93	—	ns	I_F = 12 A, V_{GS} = 0 di_F/dt = 100 A/µs

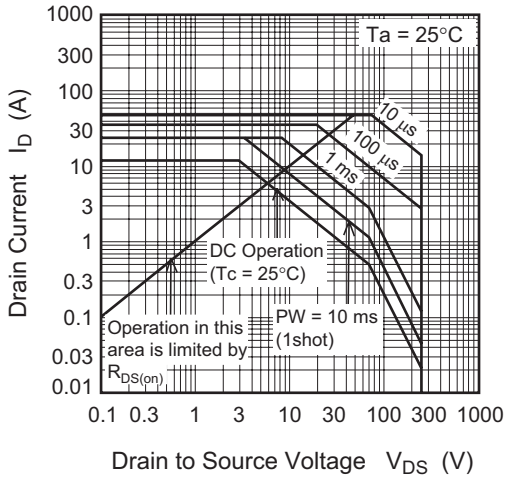
Notes: 4. Pulse test

Main Characteristics

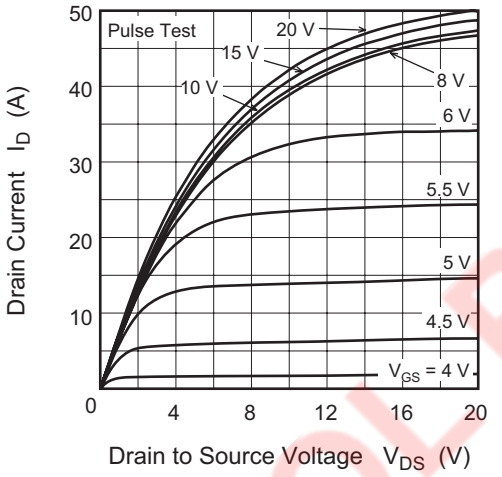
Power vs. Temperature Derating



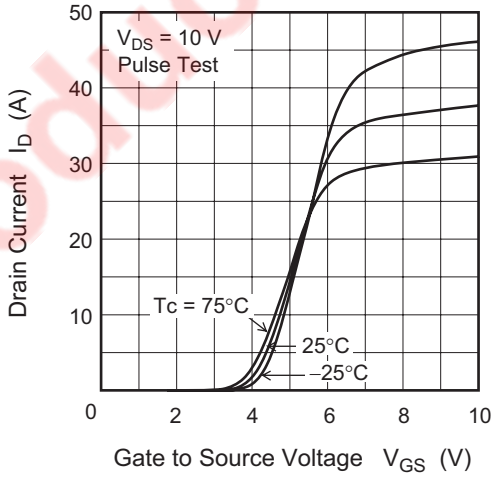
Maximum Safe Operation Area



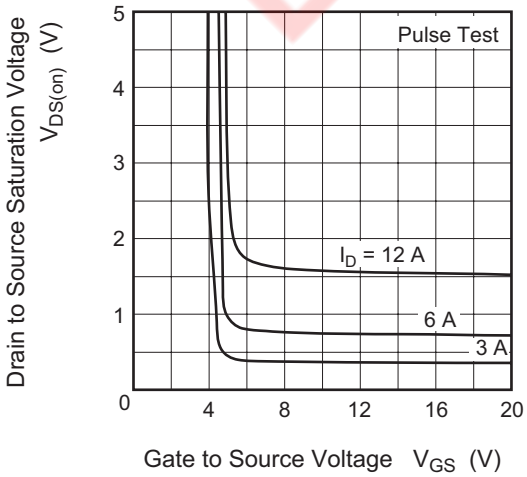
Typical Output Characteristics



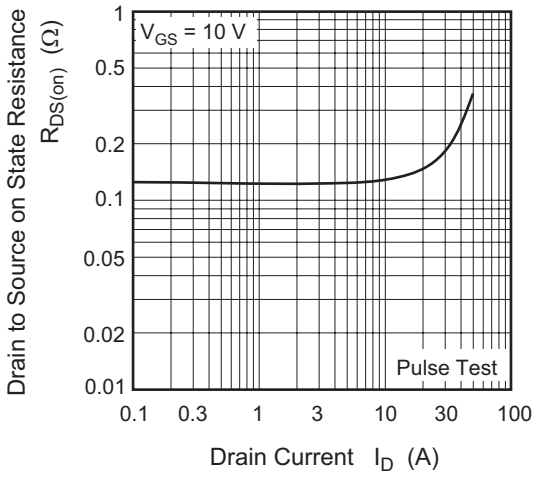
Typical Transfer Characteristics



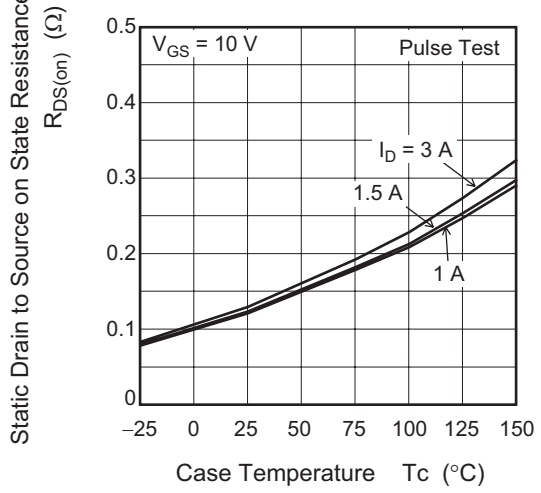
Drain to Source Saturation Voltage vs.
Gate to Source Voltage



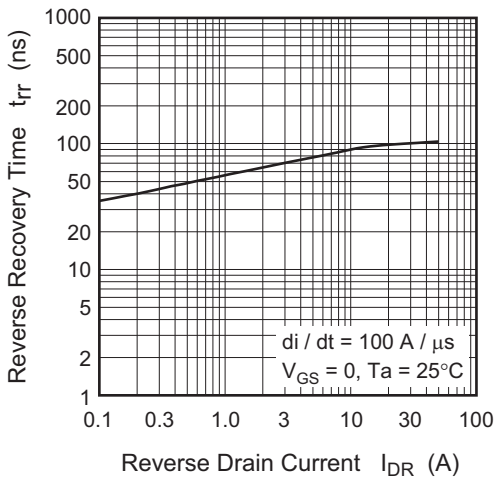
Static Drain to Source on State Resistance
vs. Drain Current



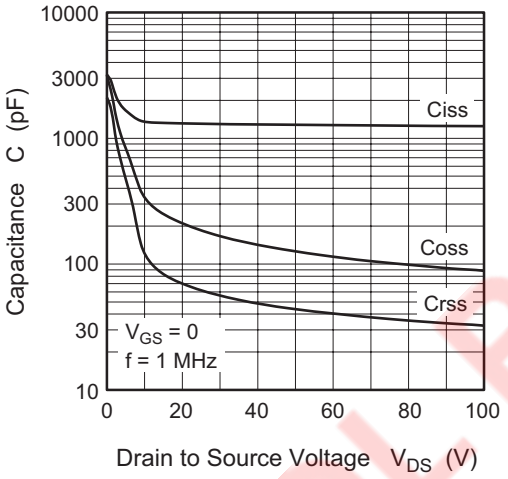
Static Drain to Source on State Resistance vs. Temperature



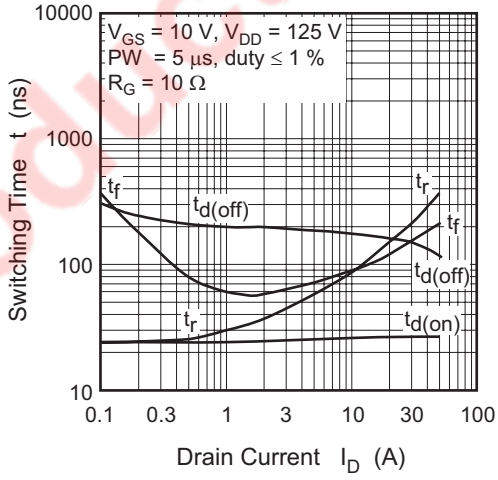
Body-Drain Diode Reverse Recovery Time



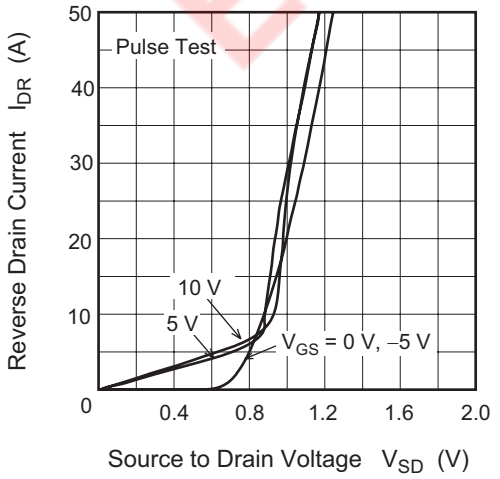
Typical Capacitance vs. Drain to Source Voltage



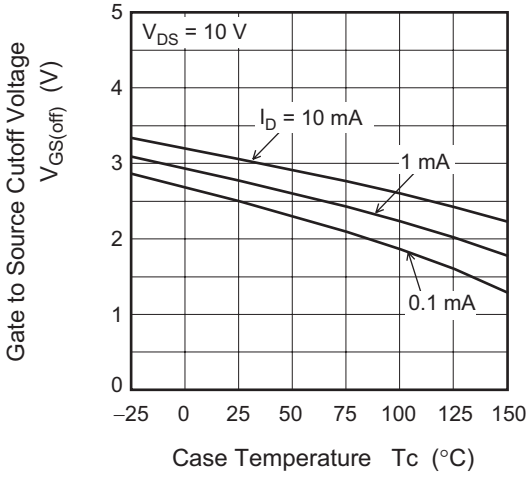
Switching Characteristics

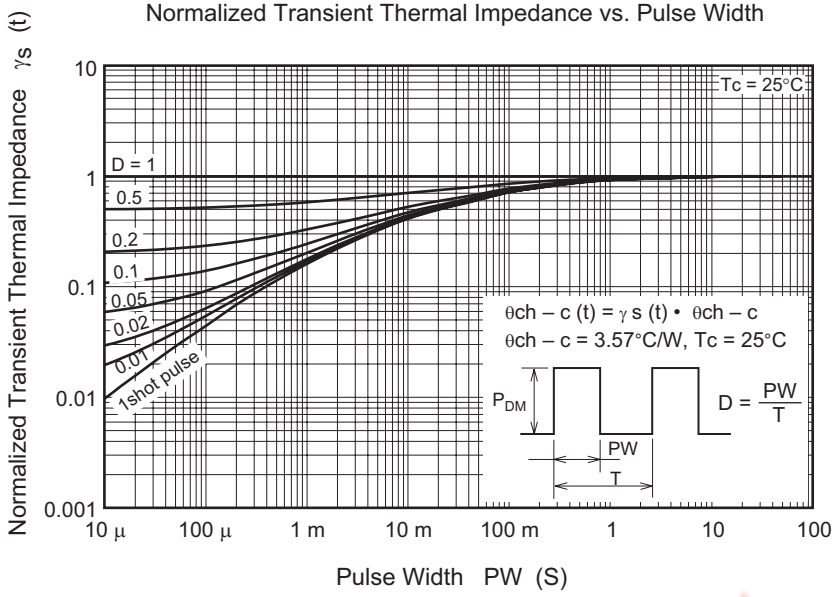


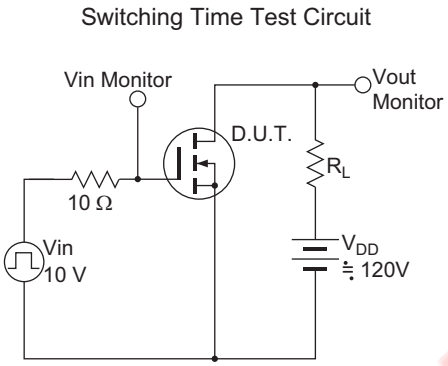
Reverse Drain Current vs. Source to Drain Voltage

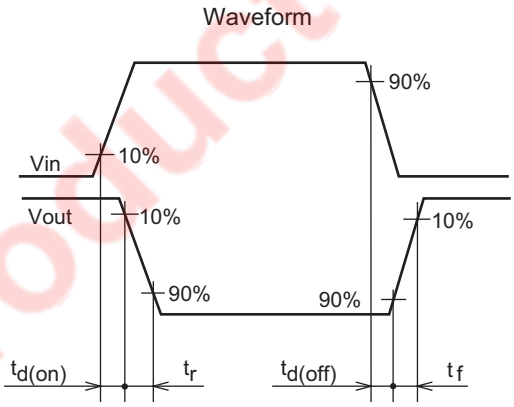


Gate to Source Cutoff Voltage vs. Case Temperature




Normalized Transient Thermal Impedance vs. Pulse Width
Normalized Transient Thermal Impedance γs (t)
Tc = 25°C
D = 1
0.5
0.2
0.1
0.05
0.02
0.01
1shot pulse
θch – c (t) = γ s (t) • θch – c
θch – c = 3.57°C/W, Tc = 25°C
PDM
D = PW / T
PW
T
10
1
0.1
0.01
0.001
10 µ
100 µ
1 m
10 m
100 m
1
10
100
Pulse Width PW (S)

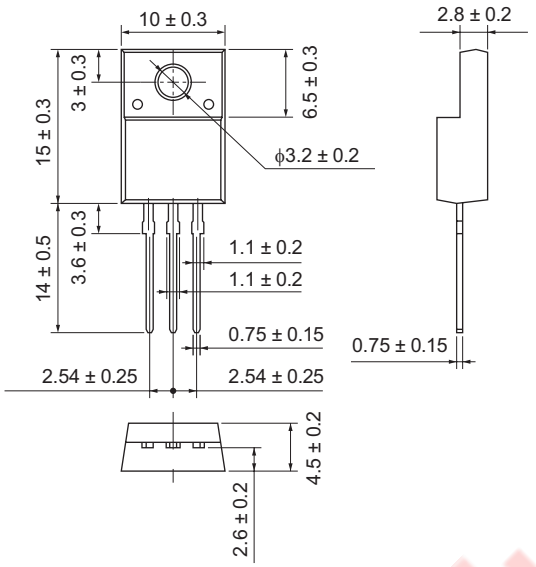

Switching Time Test Circuit
Vin Monitor
Vout Monitor
D.U.T.
RL
10 Ω
Vin
10 V
VDD
≒ 120V


Waveform
90%
Vin
10%
Vout
10%
10%
90%
90%
td(on)
tr
td(off)
tf

Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-220FN	—	PRSS0003AB-A	—	2.0g

Unit: mm



Ordering Information

Part No.	Quantity	Shipping Container
H5N2522FN-E-T2	50 pcs	Plastic magazine

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

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Renesas Technology America, Inc.
450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology (Shanghai) Co., Ltd.
Unit 204, 205, AZIACenter, No.1233 Lujiazui Ring Rd, Pudong District, Shanghai, China 200120
Tel: <86> (21) 5877-1818, Fax: <86> (21) 6887-7898

Renesas Technology Hong Kong Ltd.
7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.
10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology Singapore Pte. Ltd.
1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

Renesas Technology Korea Co., Ltd.
Kukje Center Bldg. 18th Fl., 191, 2-ka, Hangang-ro, Yongsan-ku, Seoul 140-702, Korea
Tel: <82> (2) 796-3115, Fax: <82> (2) 796-2145

Renesas Technology Malaysia Sdn. Bhd
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jalan Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: <603> 7955-9390, Fax: <603> 7955-9510

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