RJK1003DPP-E0

N-Channel MOS FET
100 V, 50 A, 11 mΩ

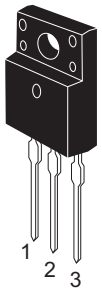
R07DS0627EJ0200
Rev.2.00
Oct 17, 2012

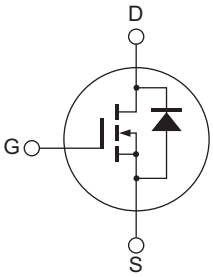
Features

- High speed switching
- Low drive current
- Low on-resistance $R_{DS(on)}$ = 8.8 mΩ typ. (at V_{GS} = 10 V)
- Package TO-220FP

Outline

RENESAS Package code: PRSS0003AG-A
(Package name: TO-220FP)





1. Gate
2. Drain
3. Source

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	100	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	50	A
Drain peak current	$I_{D\ (pulse)}$ Note1	150	A
Body-drain diode reverse drain current	I_{DR}	50	A
Avalanche current	I_{AP} Note2	25	A
Avalanche energy	E_{AS} Note2	63	mJ
Channel dissipation	Pch Note3	25	W
Channel to case thermal impedance	θch-c	5.0	°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 L = 100 μH , Tch = 25°C, Rg ≥ 50Ω,
3. Tc = 25°C

Electrical Characteristics

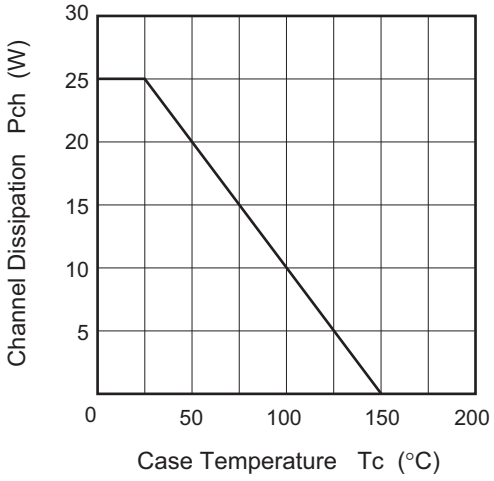
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	100	—	—	V	I_D = 10mA, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	±0.1	μA	V_{GS} = ±20 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	V_{DS} = 100 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	4.0	V	V_{DS} = 10 V, I_D = 1 mA
Static drain to source on state resistance	$R_{DS(on)}$	—	8.8	11.0	mΩ	I_D = 25 A, V_{GS} = 10 V Note4
Forward transfer admittance	$\|y_{fs}\|$	—	100	—	S	I_D = 25 A, V_D = 10 V Note4
Input capacitance	Ciss	—	4150	—	pF	V_{DS} = 10 V V_{GS} = 0 f = 1 MHz
Output capacitance	Coss	—	660	—	pF	
Reverse transfer capacitance	Crss	—	160	—	pF	
Gate Resistance	Rg	—	1.6	—	Ω	
Total gate charge	Qg	—	59	—	nC	V_{DD}= 50 V V_{GS} = 10 V, I_D = 25 A
Gate to source charge	Qgs	—	20	—	nC	
Gate to drain charge	Qgd	—	12	—	nC	
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	V_{GS} = 10 V I_D = 25 A V_{DD} ≅ 30 V Rg = 4.7 Ω
Rise time	t_r	—	9	—	ns	
Turn-off delay time	$t_{d(off)}$	—	60	—	ns	
Fall time	t_f	—	10	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.85	1.5	V	I_F = 50 A, V_{GS} = 0 Note4
Body-drain diode reverse recovery time	t_{rr}	—	55	—	ns	I_F = 50 A, V_{GS} = 0 di_F/dt = 100 A/μs

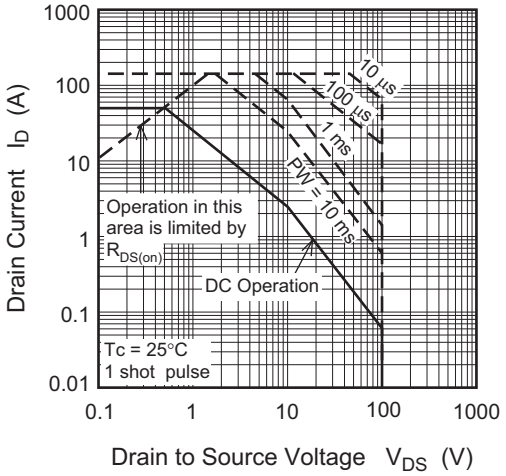
Notes: 4. Pulse test

Main Characteristics

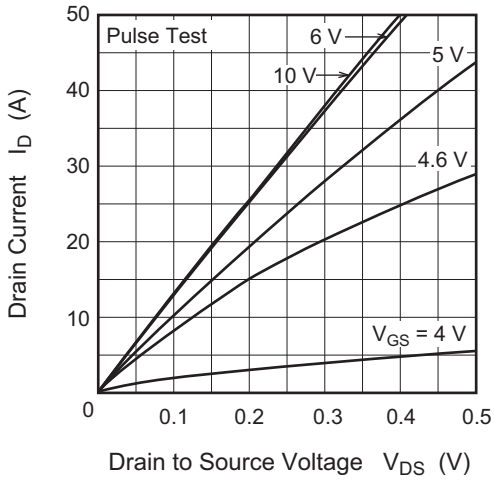
Power vs. Temperature Derating



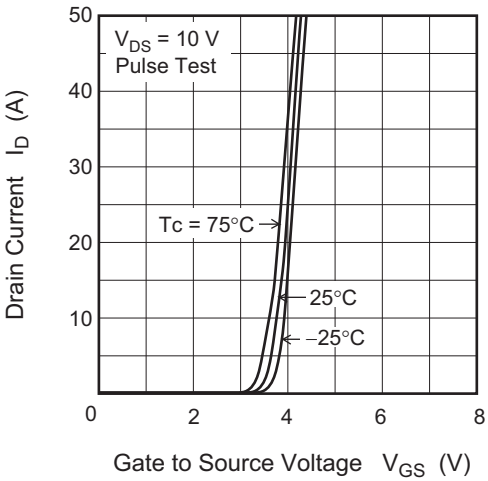
Maximum Safe Operation Area



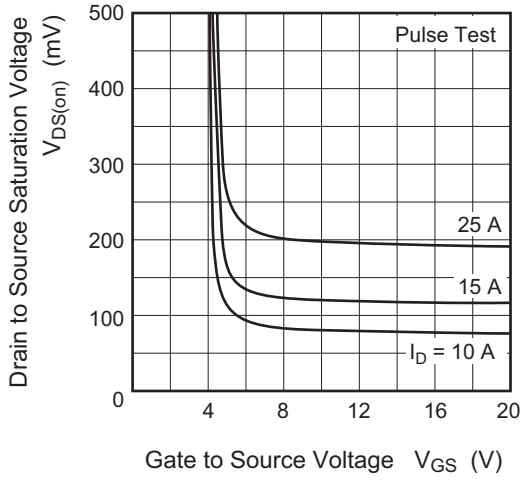
Typical Output Characteristics



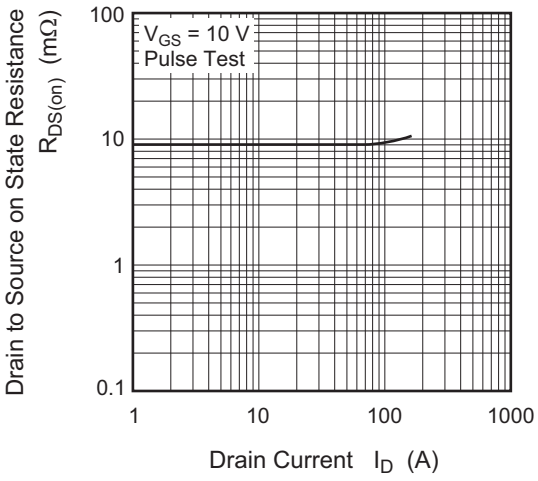
Typical Transfer Characteristics



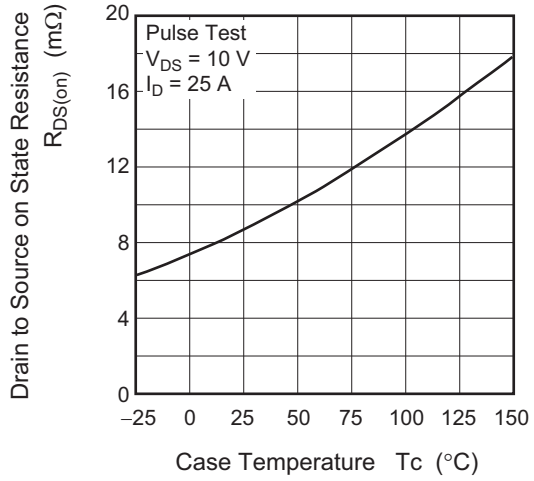
Drain to Source Saturation Voltage vs. Gate to Source Voltage



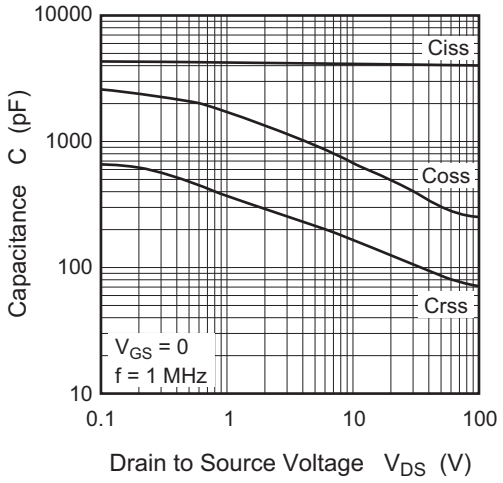
Drain to Source on State Resistance vs. Drain Current



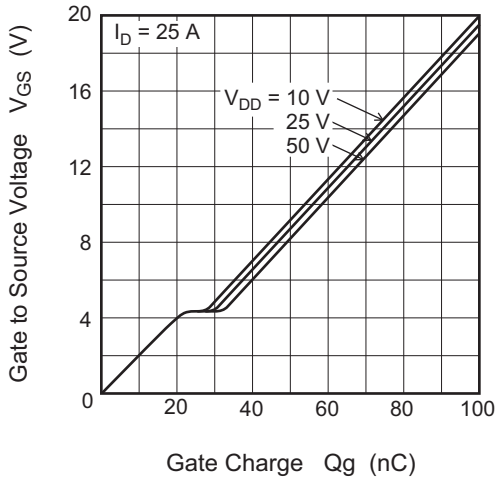
Drain to Source on State Resistance vs. Temperature



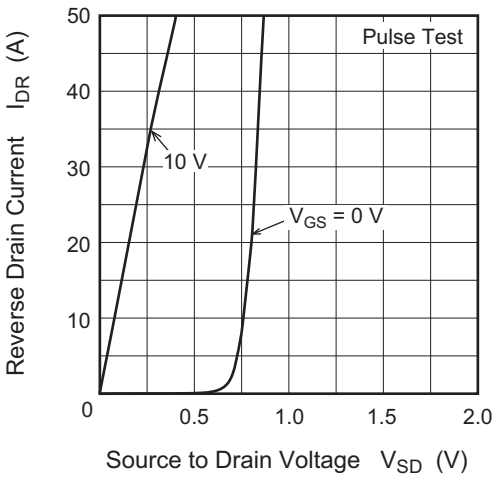
Typical Capacitance vs. Drain to Source Voltage



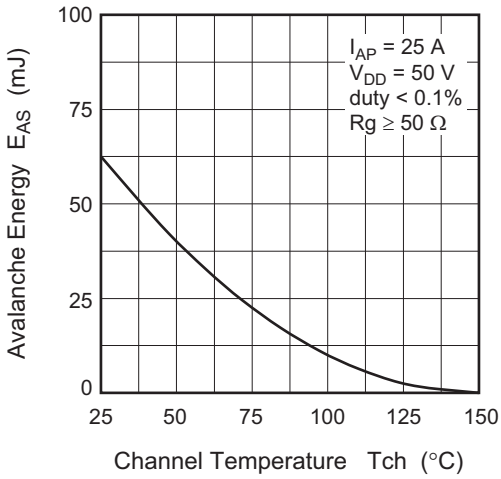
Dynamic Input Characteristics



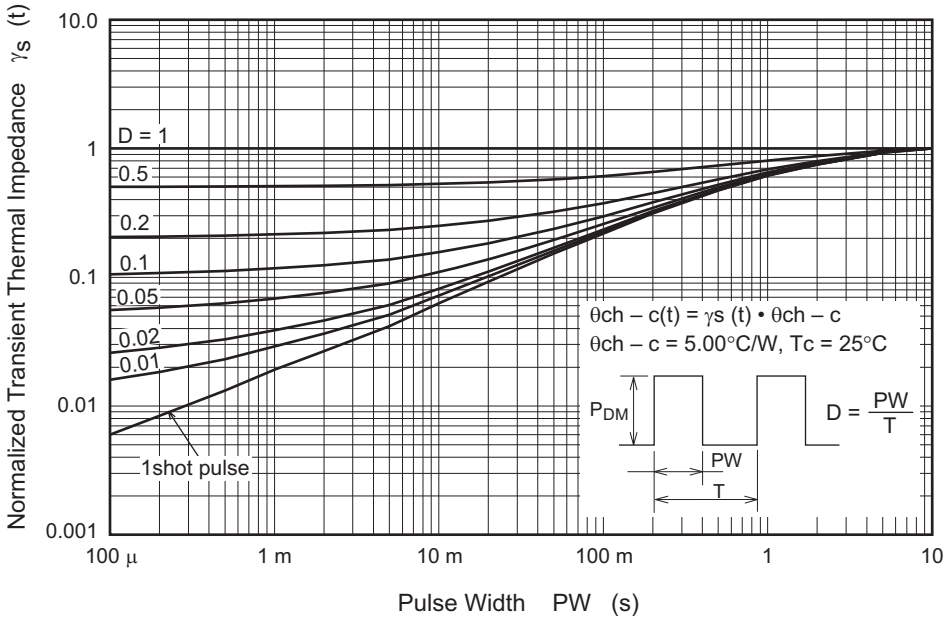
Reverse Drain Current vs. Source to Drain Voltage



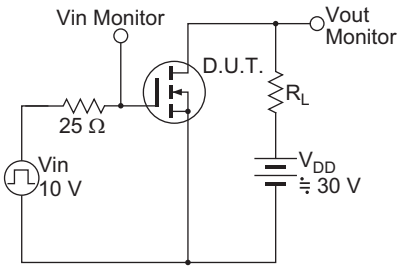
Maximum Avalanche Energy vs. Channel Temperature Derating



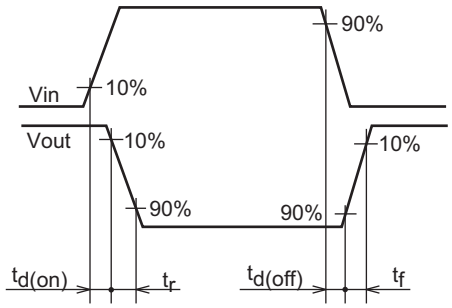
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



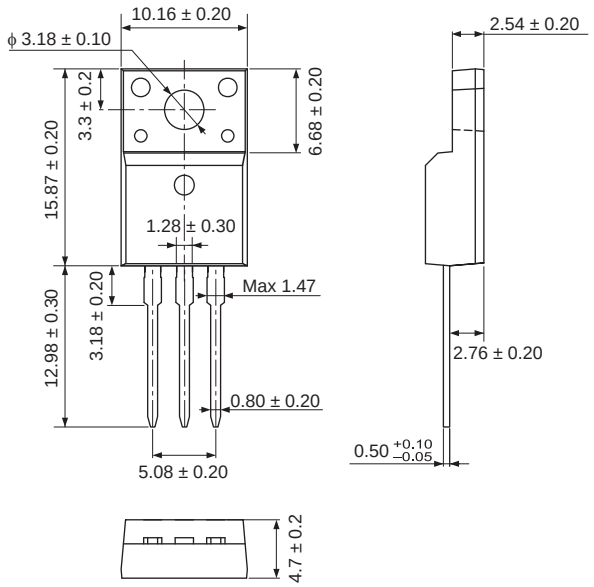
Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-220FP	—	PRSS0003AG-A	—	1.9g

Unit: mm



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJK1003DPP-E0-T2	50 pcs	Magazine (Tube)

Note: The symbol of 2nd "-" is occasionally presented as "#".

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