RJK5032DPH-E0

500V - 3A - MOS FET
High Speed Power Switching

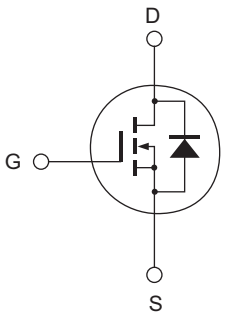
R07DS1039EJ0100
Rev.1.00
Mar 15, 2013

Features

- Low on-state resistance
  $R_{DS(on)}$ = 2.1 Ω typ. (at I_D = 1.5 A, V_{GS} = 10 V, Ta = 25°C)
- Low drive current
- High speed switching

Outline

RENESAS Package code: PRSS0004ZJ-B
(Package name: TO-251)



1. Gate
2. Drain
3. Source
4. Drain

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V_{DSS}	500	V
Gate to source voltage	V_{GSS}	±30	V
Drain current	I_D	3	A
Drain peak current	$I_{D\ (pulse)}$ Note1	6	A
Body-drain diode reverse drain current	I_{DR}	3	A
Body-drain diode reverse drain peak current	$I_{DR\ (pulse)}$ Note1	6	A
Avalanche current	I_{AP} Note2	3	A
Avalanche energy	E_{AR} Note2	0.5	mJ
Channel dissipation	Pch Note 3	40.3	W
Channel to case thermal Impedance	θch-c	3.1	°C/W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. Pulse width limited by safe operating area.
2. STch = 25°C, Tch ≤ 150°C
3. Value at Tc = 25°C

Electrical Characteristics

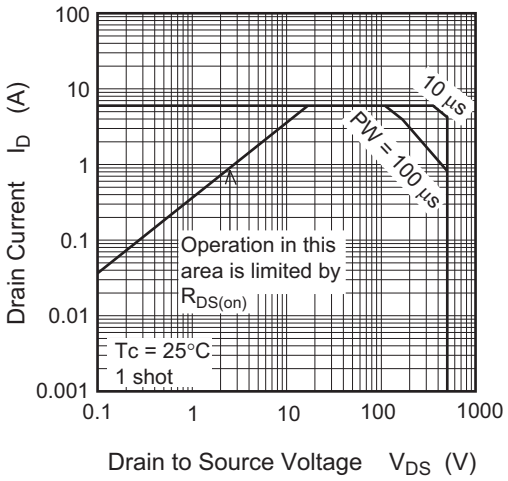
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	500	—	—	V	I_D = 1 mA, V_{GS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	V_{DS} = 500 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	$V_{GS(off)}$	3.5	—	4.5	V	V_{DS} = 10 V, I_D = 1 mA
Static drain to source on state resistance	$R_{DS(on)}$	—	2.1	2.8	Ω	I_D = 1.5 A, V_{GS} = 10 V Note 4
Input capacitance	Ciss	—	280	—	pF	V_{DS} = 25 V V_{GS} = 0 f = 1 MHz
Output capacitance	Coss	—	33	—	pF	
Reverse transfer capacitance	Crss	—	3.5	—	pF	
Turn-on delay time	$t_{d(on)}$	—	11	—	ns	I_D = 1.5 A V_{GS} = 10 V R_L = 167 Ω Rg = 10 Ω
Rise time	t_r	—	12	—	ns	
Turn-off delay time	$t_{d(off)}$	—	23	—	ns	
Fall time	t_f	—	20	—	ns	
Total gate charge	Qg	—	9.2	—	nC	V_{DD} = 400 V V_{GS} = 10 V I_D = 3 A
Gate to source charge	Qgs	—	1.8	—	nC	
Gate to drain charge	Qgd	—	4.8	—	nC	
Body-drain diode forward voltage	V_{DF}	—	0.9	1.5	V	I_F = 3 A, V_{GS} = 0 Note 4
Body-drain diode reverse recovery time	t_{rr}	—	200	—	ns	I_F = 3 A, V_{GS} = 0 di_F/dt = 100 A/μs

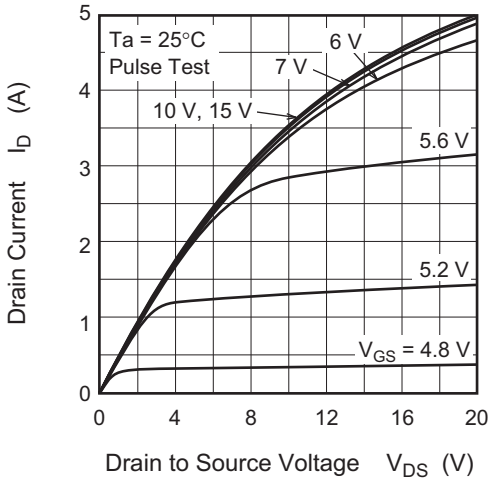
Note: 4. Pulse test

Main Characteristics

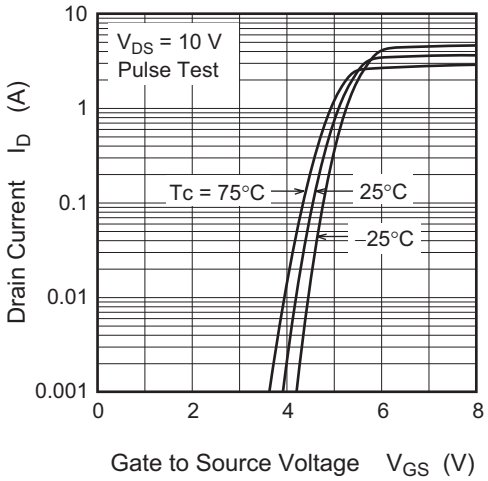
Maximum Safe Operation Area



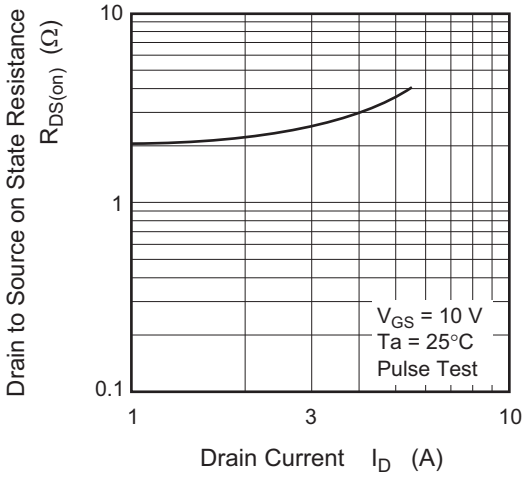
Typical Output Characteristics



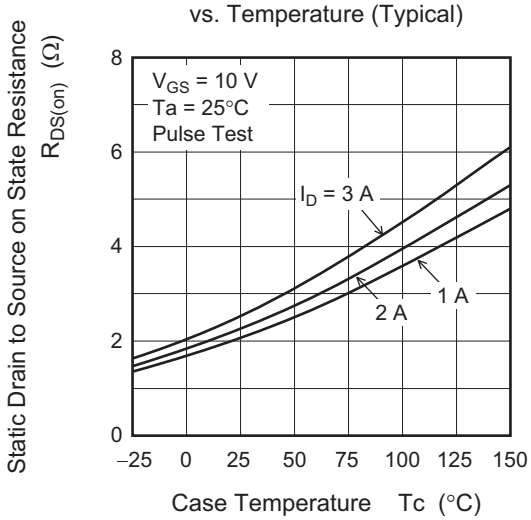
Typical Transfer Characteristics



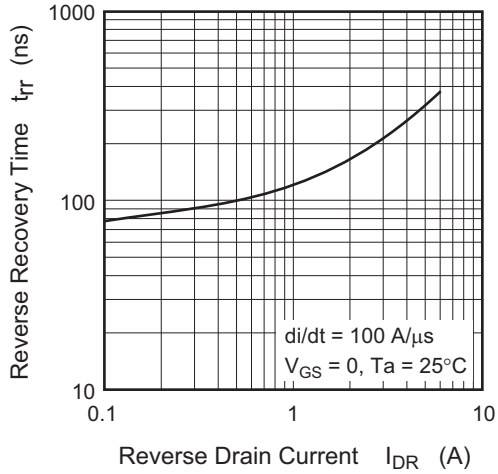
Static Drain to Source on State Resistance vs. Drain Current (Typical)



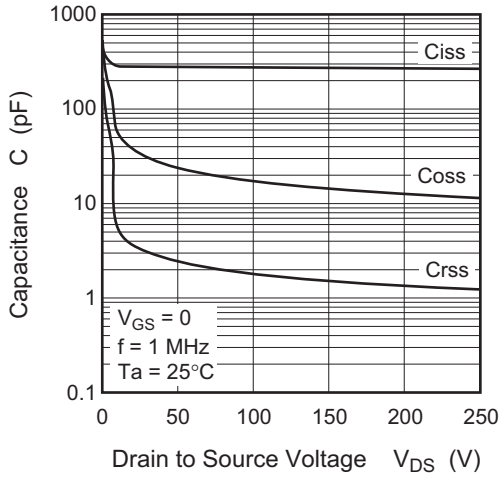
Static Drain to Source on State Resistance vs. Temperature (Typical)



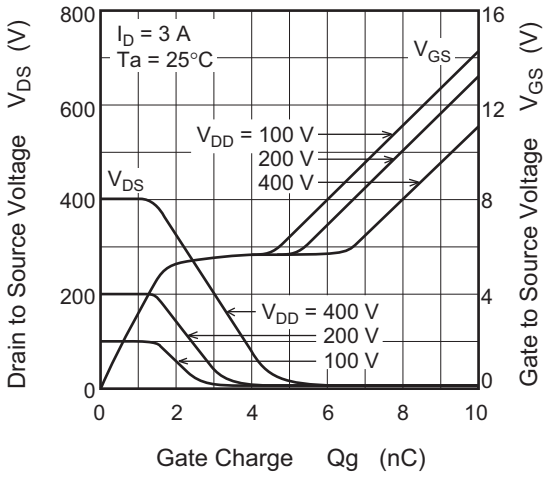
Body-Drain Diode Reverse Recovery Time (Typical)



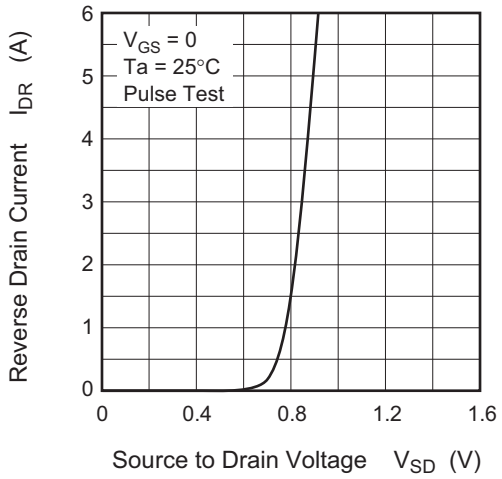
Typical Capacitance vs.
Drain to Source Voltage



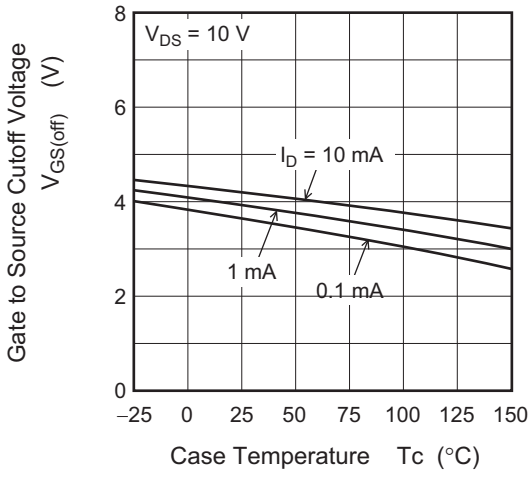
Dynamic Input Characteristics (Typical)



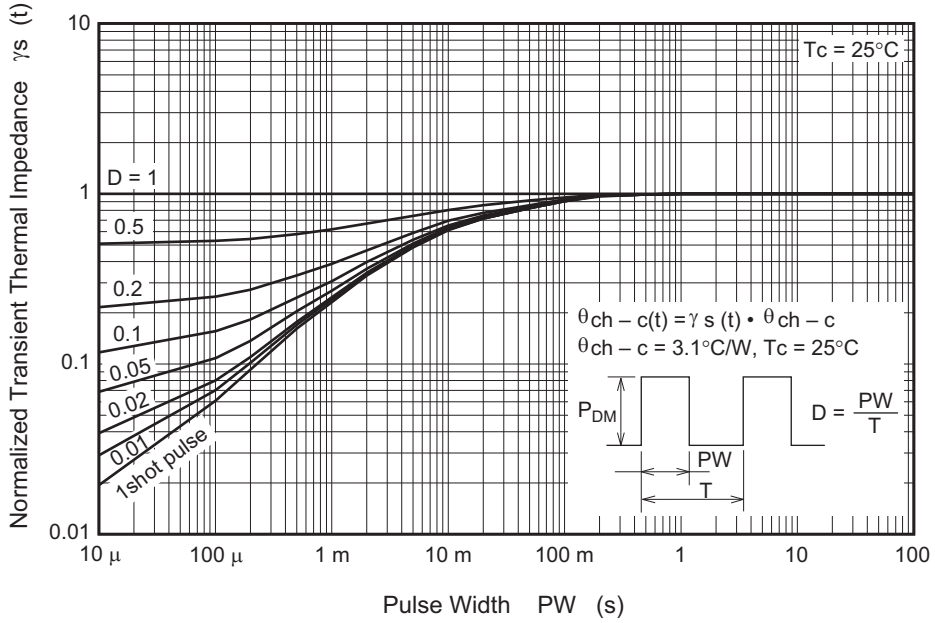
Reverse Drain Current vs.
Source to Drain Voltage (Typical)



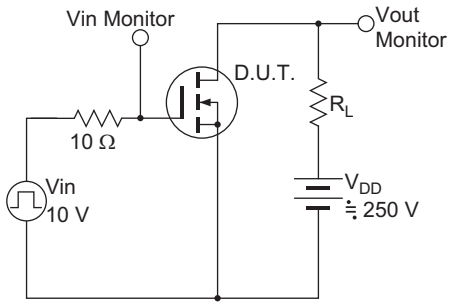
Gate to Source Cutoff Voltage
vs. Case Temperature (Typical)



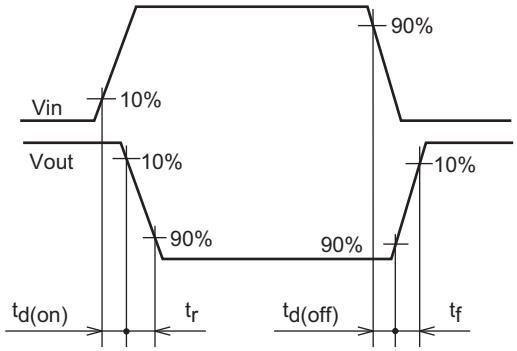
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



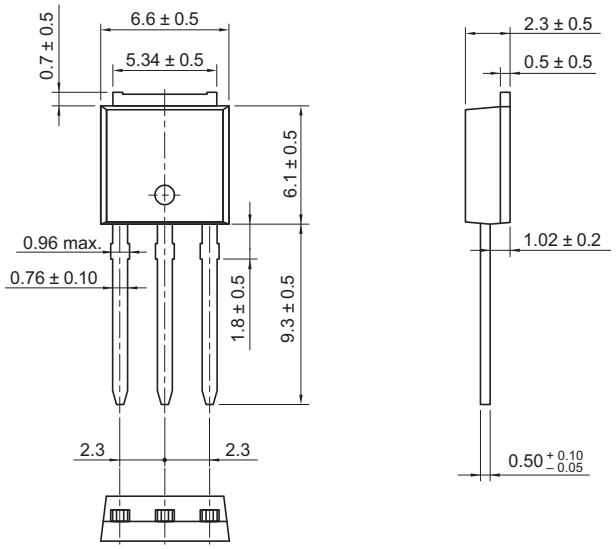
Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-251	—	PRSS0004ZJ-B	TO-251S	0.38g

Unit: mm



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJK5032DPH-E0#T2	70 pcs	Tube

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