

RJK6012DPP-E0

600V - 10A - MOS FET
High Speed Power Switching

R07DS0611EJ0100

Rev.1.00

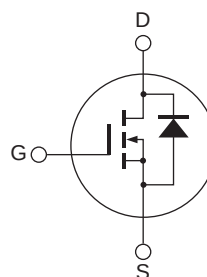
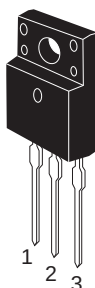
Mar 16, 2012

Features

- Low on-resistance
 $R_{DS(on)} = 0.77 \Omega$ typ. (at $I_D = 5 A$, $V_{GS} = 10 V$, $T_a = 25^\circ C$)
- Low leakage current
- High speed switching

Outline

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



1. Gate
2. Drain
3. Source

Absolute Maximum Ratings

($T_a = 25^\circ C$)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	600	V
Gate to source voltage	V_{GSS}	± 30	V
Drain current	I_D ^{Note4}	10	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	20	A
Body-drain diode reverse drain current	I_{DR}	10	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ ^{Note1}	20	A
Avalanche current	I_{AP} ^{Note3}	3	A
Avalanche energy	E_{AR} ^{Note3}	0.49	mJ
Channel dissipation	P_{ch} ^{Note2}	30	W
Channel to case thermal impedance	θ_{ch-c}	4.17	$^\circ C/W$
Channel temperature	T_{ch}	150	$^\circ C$
Storage temperature	T_{stg}	-55 to +150	$^\circ C$

- Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$
2. Value at $T_c = 25^\circ C$
3. $ST_{ch} = 25^\circ C$, $T_{ch} \leq 150^\circ C$
4. Limited by maximum safe operation area

Electrical Characteristics

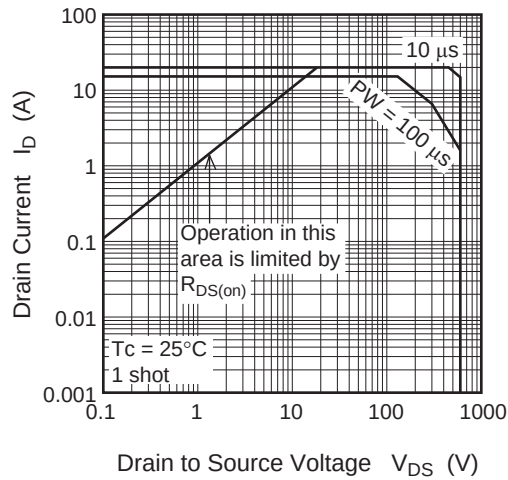
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	600	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 600 \text{ V}$, $V_{GS} = 0$
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	$V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.77	0.92	Ω	$I_D = 5 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note 5}
Input capacitance	C_{iss}	—	1100	—	pF	$V_{DS} = 25 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	110	—	pF	
Reverse transfer capacitance	C_{rss}	—	13	—	pF	
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	$I_D = 5 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 60 \Omega$ $R_g = 10 \Omega$
Rise time	t_r	—	22	—	ns	
Turn-off delay time	$t_{d(off)}$	—	80	—	ns	
Fall time	t_f	—	17	—	ns	
Total gate charge	Q_g	—	30	—	nC	$V_{DD} = 480 \text{ V}$ $V_{GS} = 10 \text{ V}$ $I_D = 10 \text{ A}$
Gate to source charge	Q_{gs}	—	6.5	—	nC	
Gate to drain charge	Q_{gd}	—	14.5	—	nC	
Body-drain diode forward voltage	V_{DF}	—	0.88	1.50	V	$I_F = 10 \text{ A}$, $V_{GS} = 0$ ^{Note 5}
Body-drain diode reverse recovery time	t_{rr}	—	350	—	ns	$I_F = 10 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

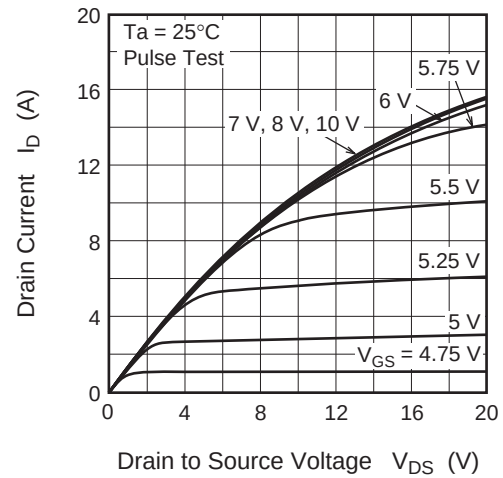
Notes: 5. Pulse test

Main Characteristics

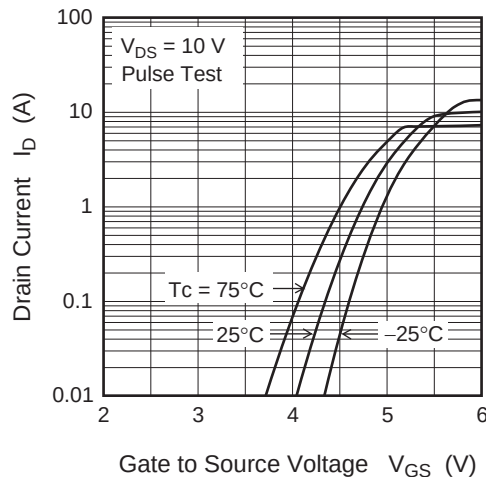
Maximum Safe Operation Area



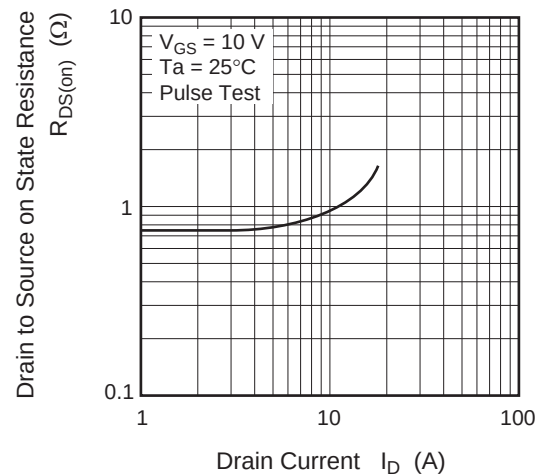
Typical Output Characteristics



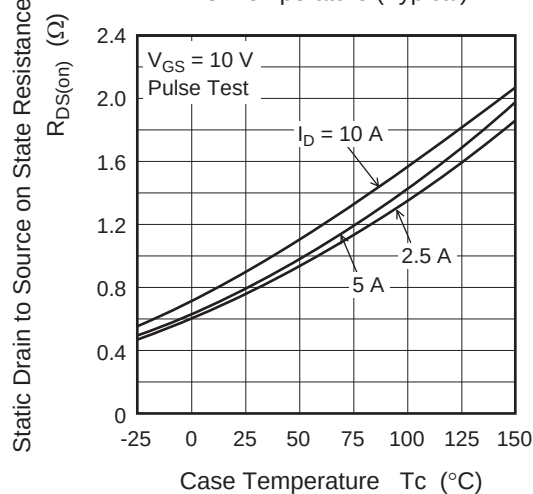
Typical Transfer Characteristics



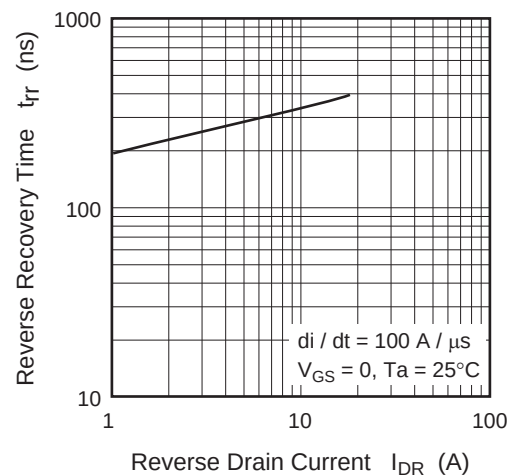
Static Drain to Source on State Resistance vs. Drain Current (Typical)



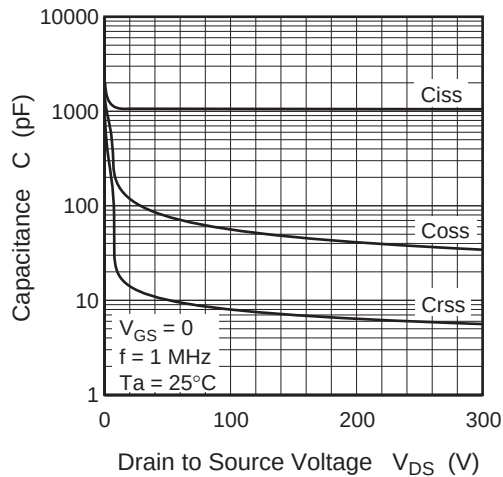
Static Drain to Source on State Resistance vs. Temperature (Typical)



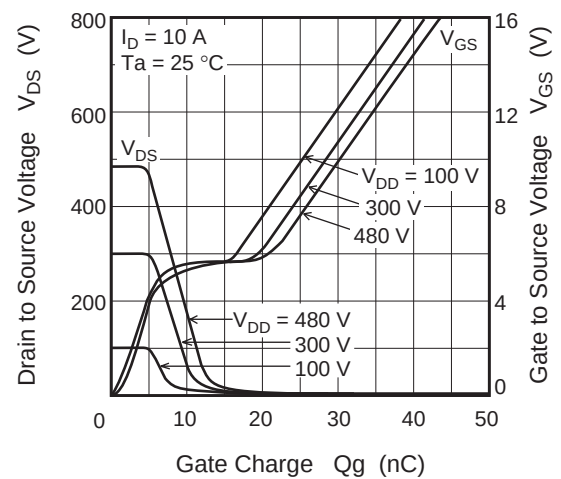
Body-Drain Diode Reverse Recovery Time (Typical)



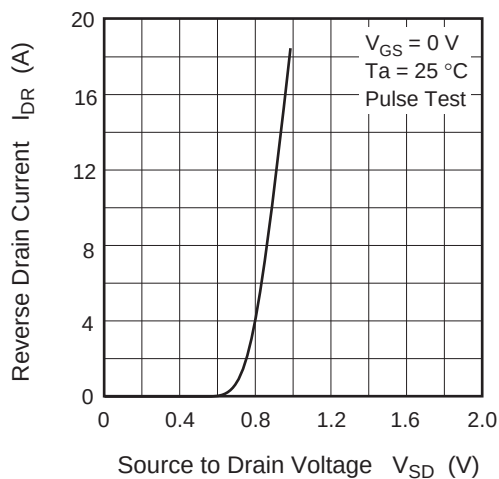
Typical Capacitance vs.
Drain to Source Voltage



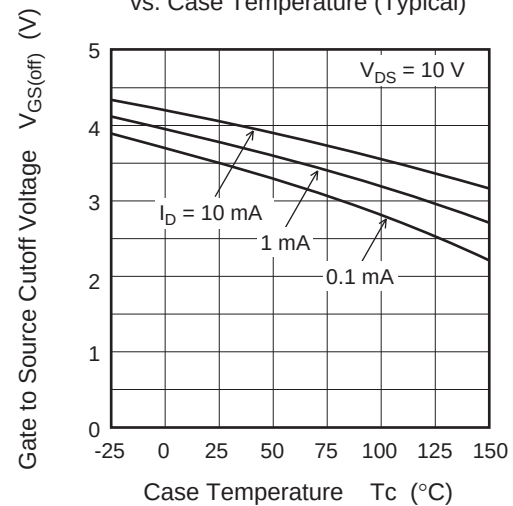
Dynamic Input Characteristics (Typical)



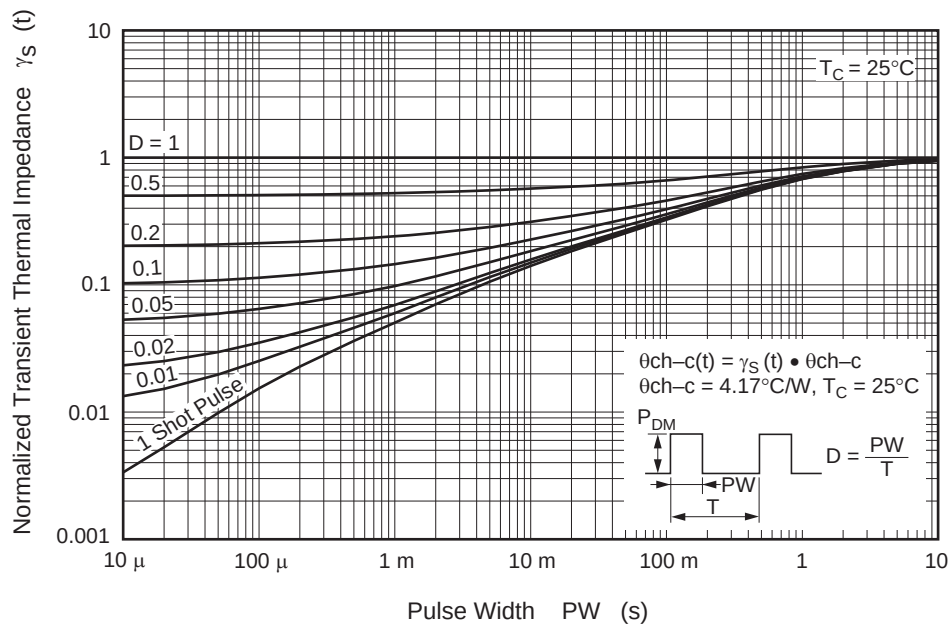
Reverse Drain Current vs.
Source to Drain Voltage (Typical)



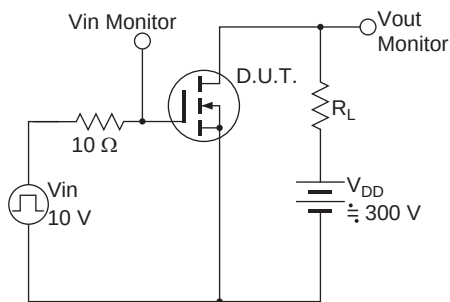
Gate to Source Cutoff Voltage
vs. Case Temperature (Typical)



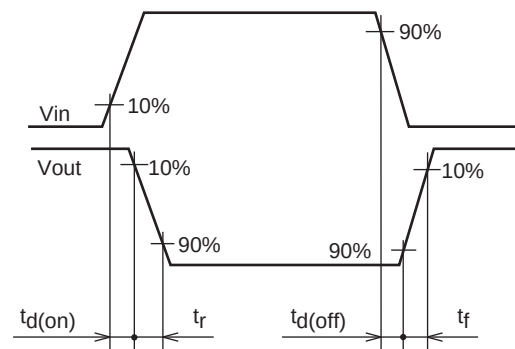
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



Waveform



Package Dimensions

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

The drawing shows the mechanical dimensions of the RJK6012DPP-E0 package. The top view shows a rectangular body with a width of 10.16 ± 0.20 mm and a height of 6.68 ± 0.20 mm. The top surface has a central circular feature with a diameter of $\phi 3.18 \pm 0.10$ mm. The side view shows a total height of 15.87 ± 0.20 mm, with a base height of 12.98 ± 0.30 mm. The base has three pins with a width of 5.08 ± 0.20 mm and a pin width of 0.80 ± 0.20 mm. The pin height is 3.18 ± 0.20 mm, and the maximum pin length is $\text{Max } 1.47$ mm. The bottom view shows a width of 5.08 ± 0.20 mm and a height of 4.7 ± 0.2 mm. The side view also shows a top flange width of 2.54 ± 0.20 mm and a base width of 2.76 ± 0.20 mm. The base has a thickness of $0.50^{+0.10}_{-0.05}$ mm.

Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJK6012DPP-E0#T2	1000 pcs	Box (Tube)

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