

# RJK60S2DPP-E0

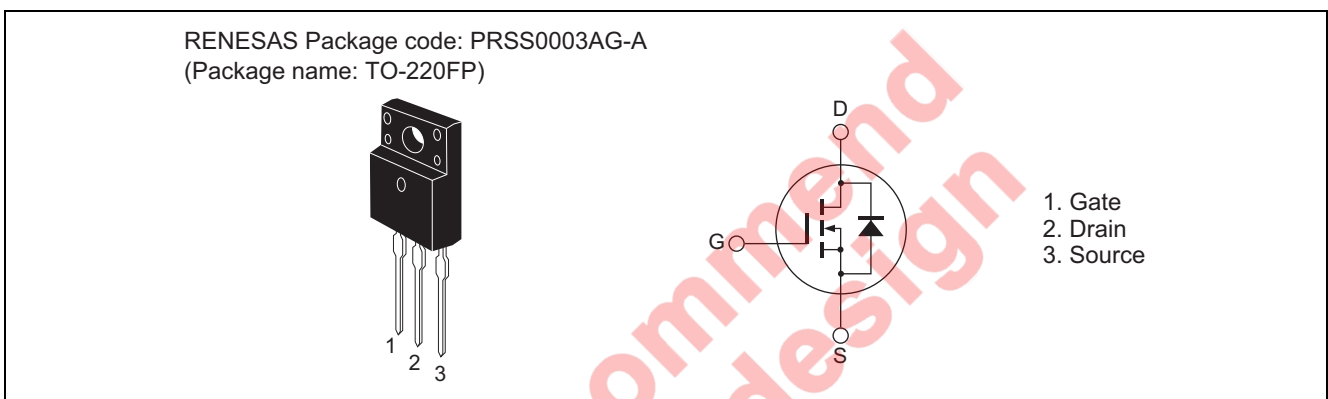
600V - 10A - SJ MOS FET  
High Speed Power Switching

R07DS0742EJ0004  
Rev.0.04  
Jan 21, 2013

## Features

- Superjunction MOSFET
- Low on-resistance  
 $R_{DS(on)} = 0.53 \Omega$  typ. (at  $I_D = 4 A$ ,  $V_{GS} = 10 V$ ,  $T_a = 25^\circ C$ )
- High speed switching  
 $t_f = 33 ns$  typ. (at  $I_D = 4 A$ ,  $V_{GS} = 10 V$ ,  $R_L = 75 \Omega$ ,  $R_g = 10 \Omega$ ,  $T_a = 25^\circ C$ )

## Outline



## 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, -20	V
Drain current	$T_C = 25^\circ C$	$I_D$ <sup>Note1,2</sup>	10 A
	$T_C = 100^\circ C$	$I_D$ <sup>Note1,2</sup>	6.3 A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	20	A
Body-drain diode reverse drain current	$I_{DR}$ <sup>Note1</sup>	10	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ <sup>Note1</sup>	20	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	2	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	0.21	mJ
Channel dissipation	$P_{ch}$ <sup>Note4</sup>	26.3	W
Channel to case thermal impedance	$\theta_{ch-c}$	4.75	$^\circ C/W$
Channel temperature	$T_{ch}$	150	$^\circ C$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ C$

- Notes: 1. Limited by  $T_{ch}$  max.  
2. Maximum duty cycle  $D = 0.75$   
3.  $ST_{ch} = 25^\circ C$ ,  $T_{ch} \leq 150^\circ C$   
4. Value at  $T_c = 25^\circ C$

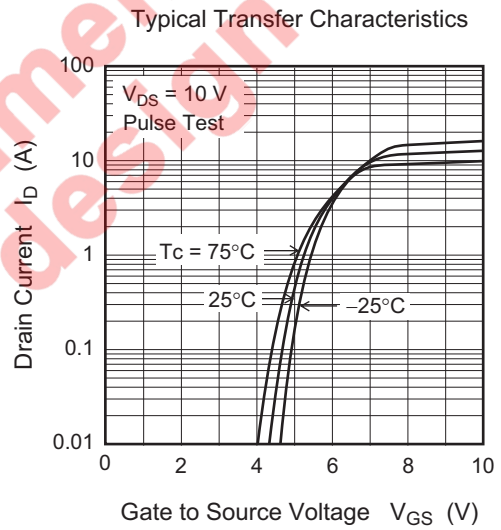
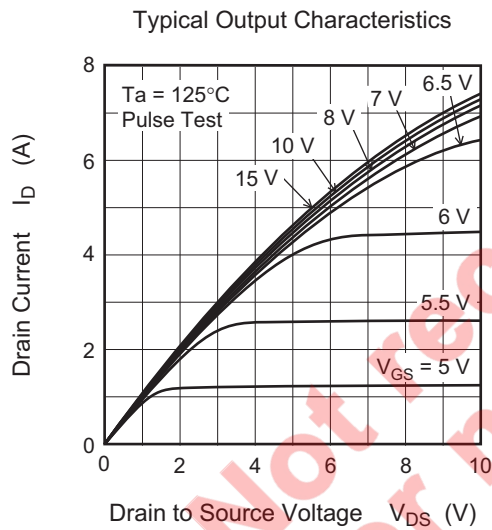
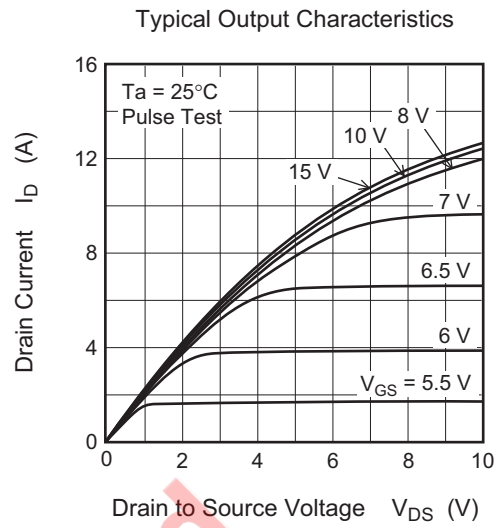
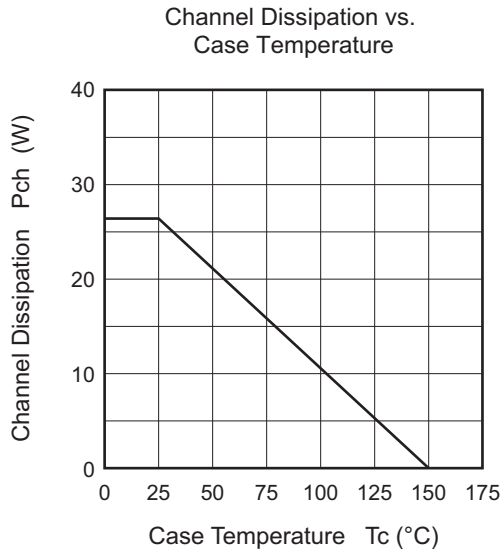
## Electrical Characteristics

(Ta = 25°C)

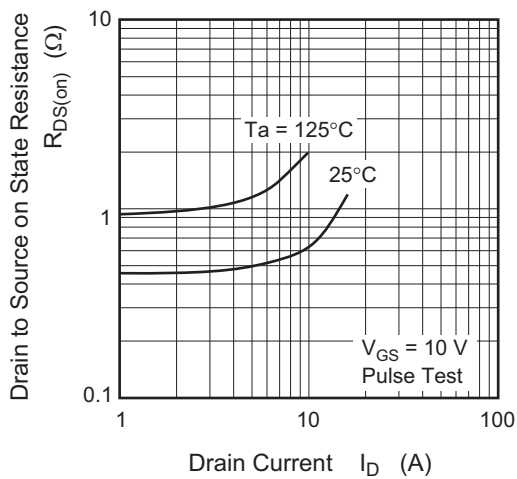
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	600	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	mA	$V_{DS} = 600 \text{ V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = +30\text{V}$ , $-20 \text{ V}$ , $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	3	—	5	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.53	0.67	$\Omega$	$I_D = 4 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note 5</sup>
	$R_{DS(on)}$	—	1.27	—	$\Omega$	Ta = 150°C $I_D = 4 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note 5</sup>
Gate resistance	Rg	—	2.7	—	$\Omega$	f = 1 MHz $V_{DS} = 25 \text{ V}$ , $V_{GS} = 0$
Input capacitance	Ciss	—	530	—	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	Coss	—	715	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	Crss	—	2.8	—	pF	f = 100 kHz
Turn-on delay time	$t_{d(on)}$	—	11	—	ns	$I_D = 4 \text{ A}$
Rise time	$t_r$	—	17	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	22	—	ns	$R_L = 75 \Omega$
Fall time	$t_f$	—	33	—	ns	Rg = 10 $\Omega$ <sup>Note 5</sup>
Body-drain diode forward voltage	$V_{DF}$	—	1.0	1.6	V	$I_F = 8 \text{ A}$ , $V_{GS} = 0$ <sup>Note5</sup>
Total gate charge	Qg	—	11.6	—	nC	$V_{DD} = 480 \text{ V}$
Gate to source charge	Qgs	—	2.8	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	Qgd	—	4.9	—	nC	$I_D = 1 \text{ A}$ <sup>Note5</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	280	—	ns	$I_F = 8 \text{ A}$
Body-drain diode reverse recovery current	$I_{rr}$	—	16.5	—	A	$V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$ <sup>Note5</sup>
Body-drain diode reverse recovery charge	Q <sub>rr</sub>	—	2.5	—	$\mu\text{C}$	

Notes: 5. Pulse test

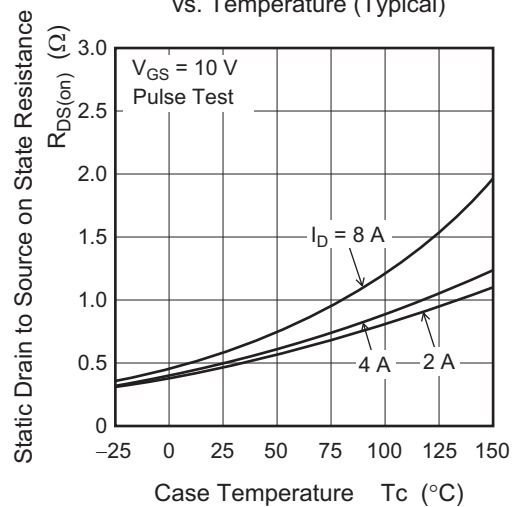
Main Characteristics



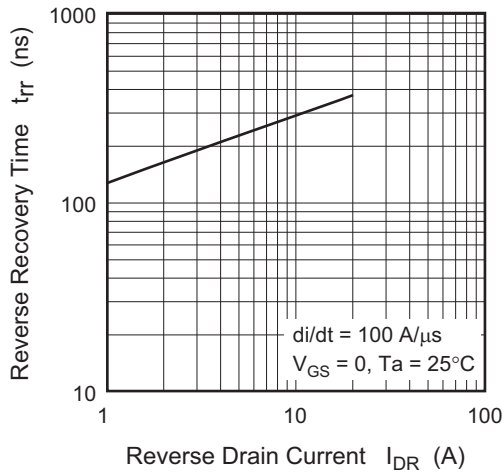
Static Drain to Source on State Resistance vs. Drain Current (Typical)



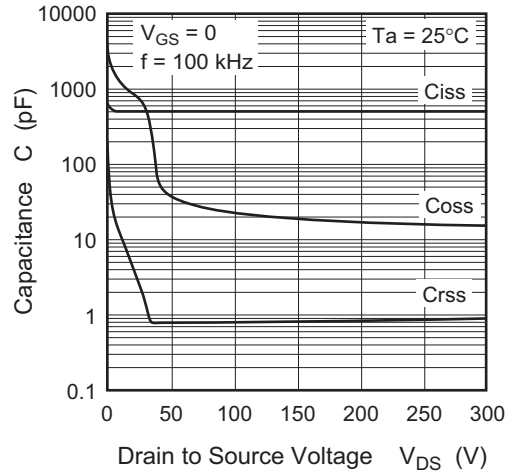
Static Drain to Source on State Resistance vs. Temperature (Typical)



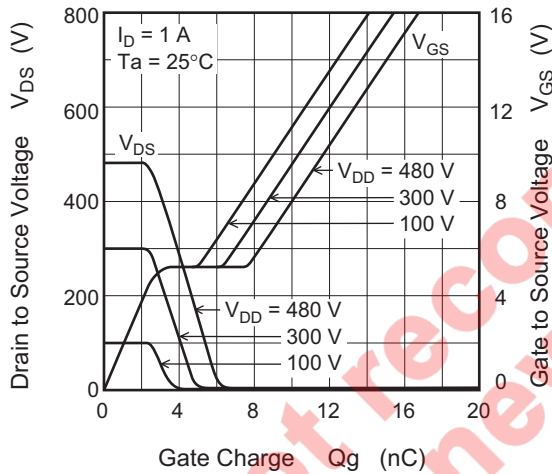
Body-Drain Diode Reverse Recovery Time (Typical)



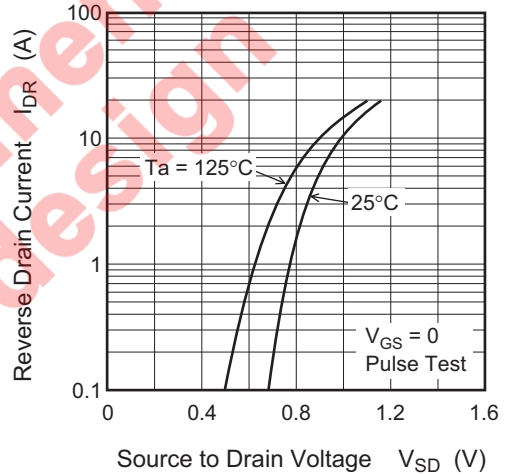
Typical Capacitance vs. Drain to Source Voltage



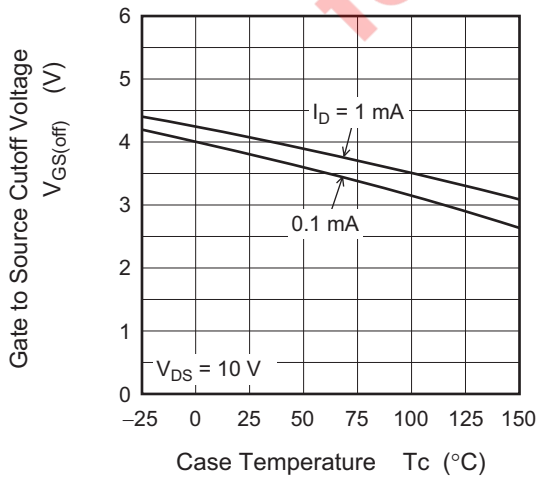
Dynamic Input Characteristics (Typical)



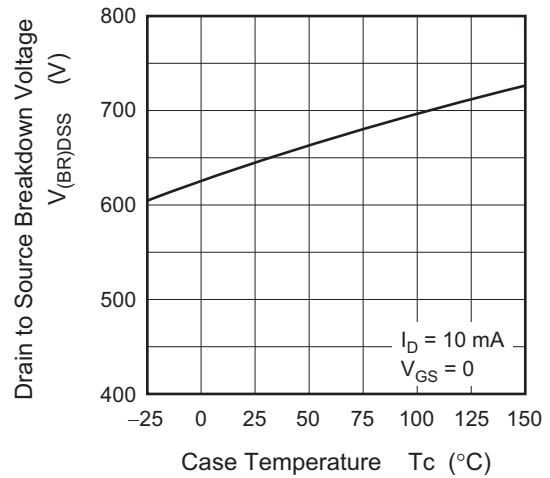
Reverse Drain Current vs. Source to Drain Voltage (Typical)



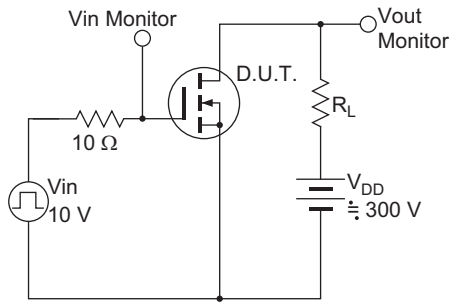
Gate to Source Cutoff Voltage vs. Case Temperature (Typical)



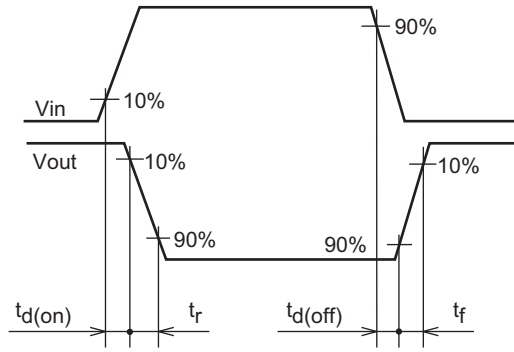
Drain to Source Breakdown Voltage vs. Case Temperature (Typical)



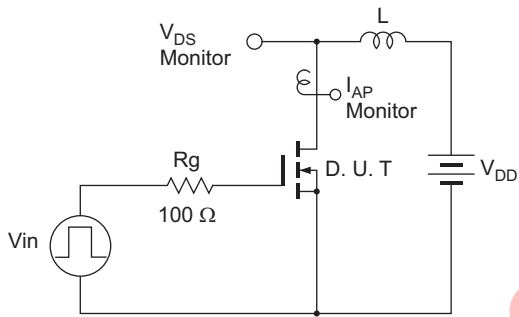
Switching Time Test Circuit



Waveform

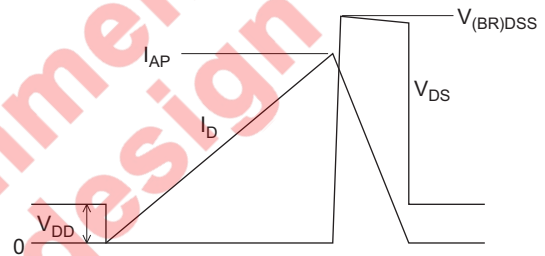


Avalanche Test Circuit



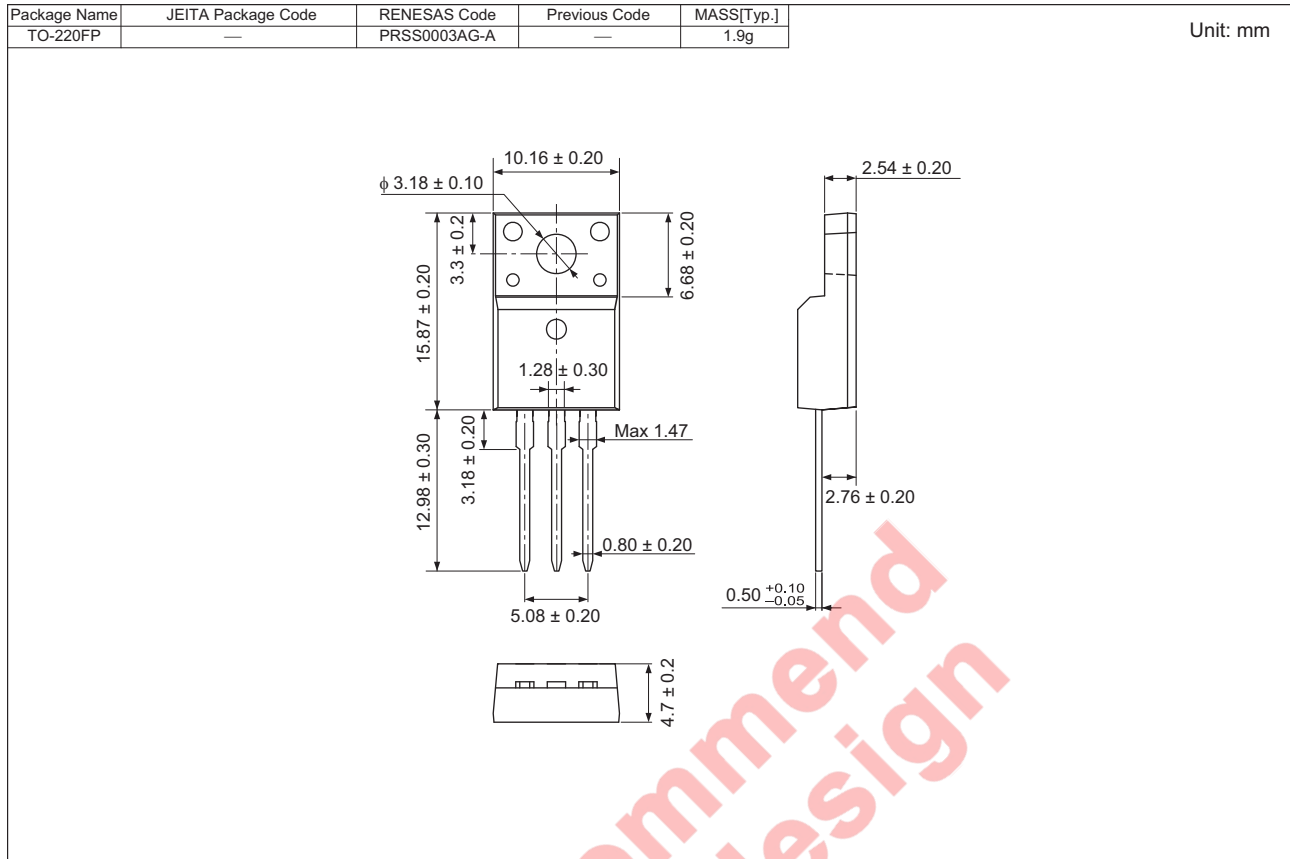
Avalanche Waveform

$$E_{AR} = \frac{1}{2} L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



Not recommended for new design

Package Dimension



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJK60S2DPP-E0#T2	50 pcs	Tube

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