

RJK60S7DPP-E0

600V - 30A - SJ MOS FET
High Speed Power Switching

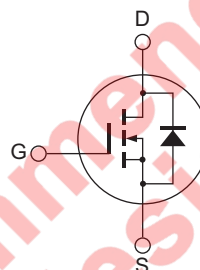
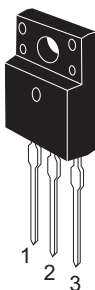
R07DS0643EJ0300
Rev.3.00
Dec 10, 2012

Features

- Superjunction MOSFET
- Low on-resistance
 $R_{DS(on)} = 0.1 \Omega$ typ. (at $I_D = 15 A$, $V_{GS} = 10 V$, $T_a = 25^\circ C$)
- High speed switching
 $t_f = 9 ns$ typ. (at $I_D = 15 A$, $V_{GS} = 10 V$, $R_L = 20 \Omega$, $R_g = 10 \Omega$, $T_a = 25^\circ C$)

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, -20	V
Drain current	I_D ^{Note1}	30	A
	I_D ^{Note1}	19	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	60	A
Body-drain diode reverse drain current	I_{DR} ^{Note1}	30	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ ^{Note1}	60	A
Avalanche current	I_{AP} ^{Note2}	7.5	A
Avalanche energy	E_{AR} ^{Note2}	3.06	mJ
Channel dissipation	P_{ch} ^{Note3}	34.7	W
Channel to case thermal impedance	θ_{ch-c}	3.6	$^\circ C/W$
Channel temperature	T_{ch}	150	$^\circ C$
Storage temperature	T_{stg}	-55 to +150	$^\circ C$

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

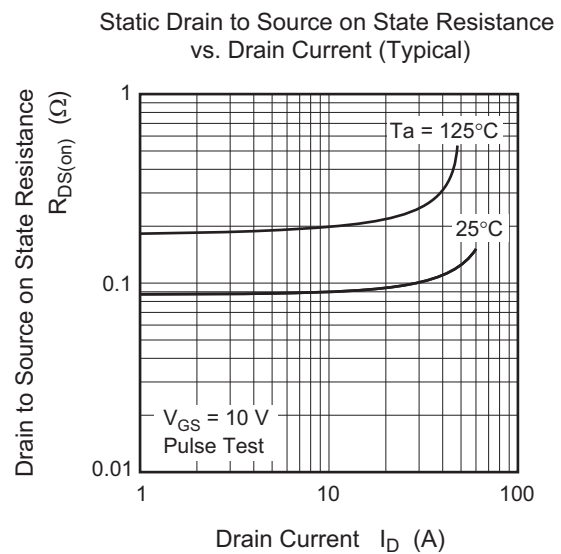
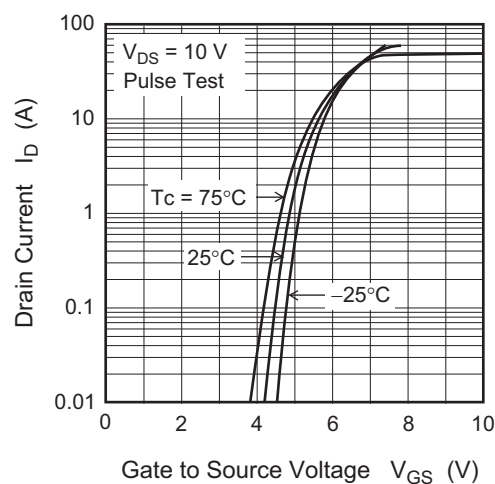
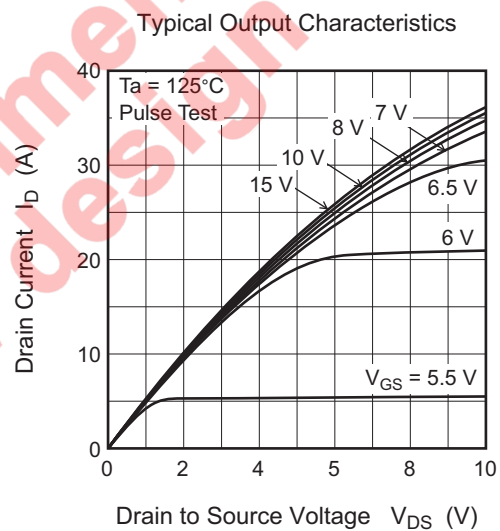
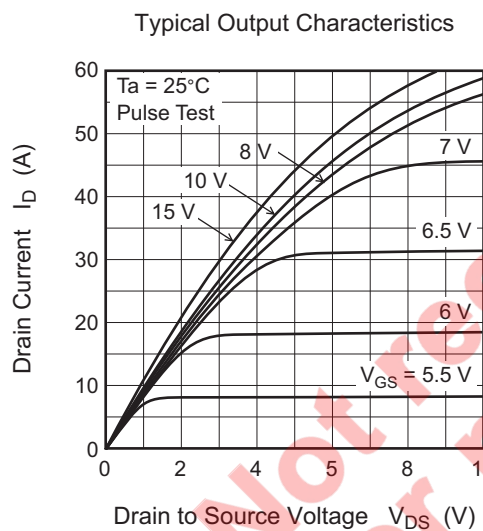
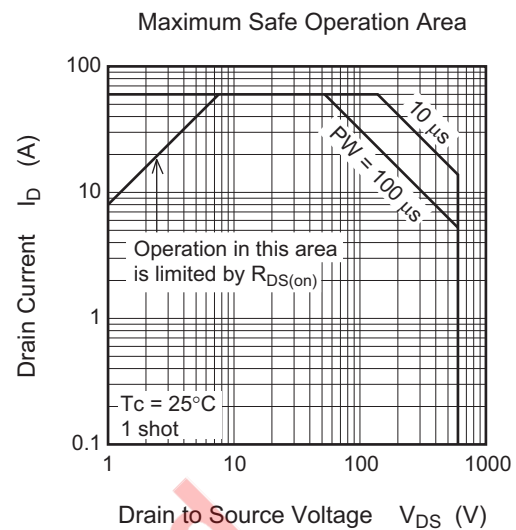
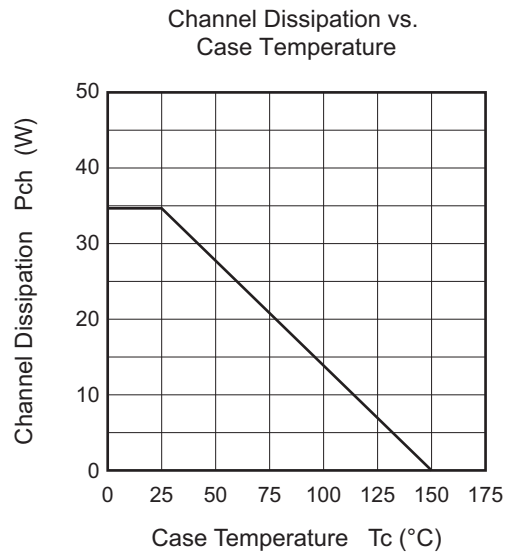
Electrical Characteristics

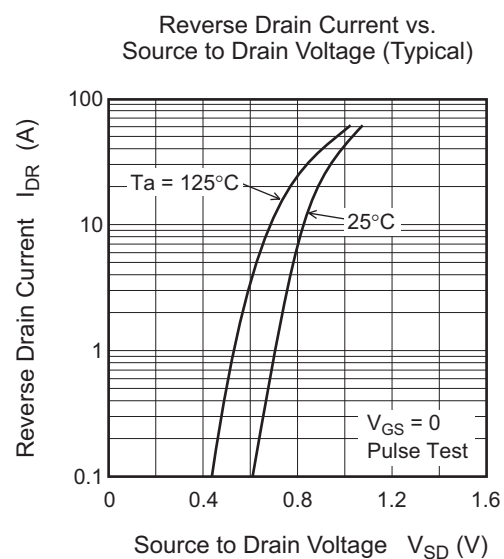
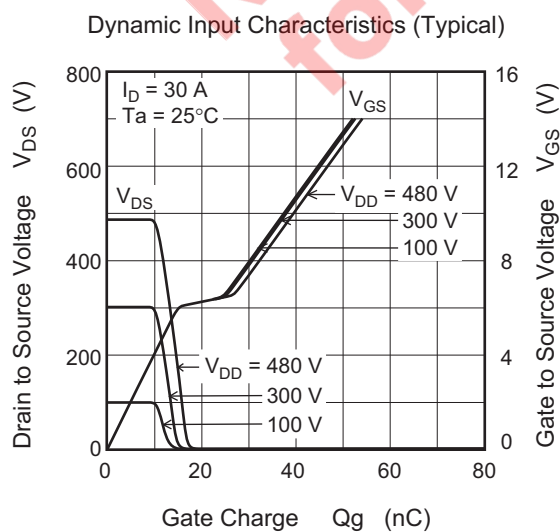
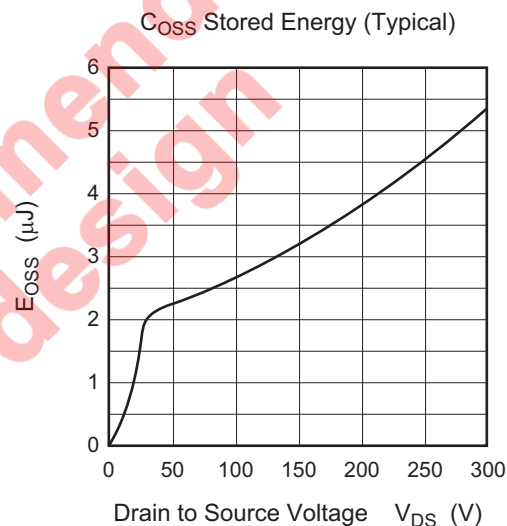
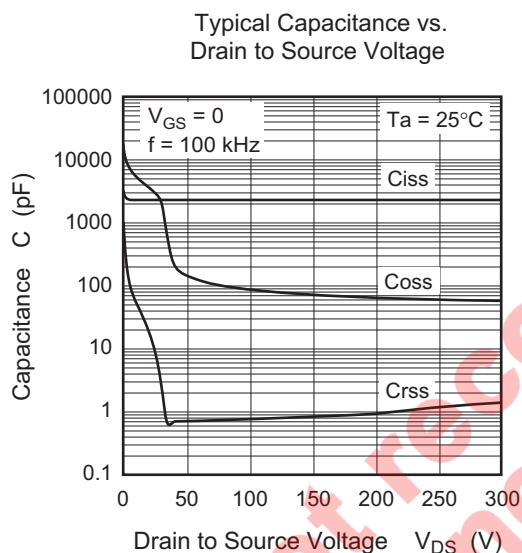
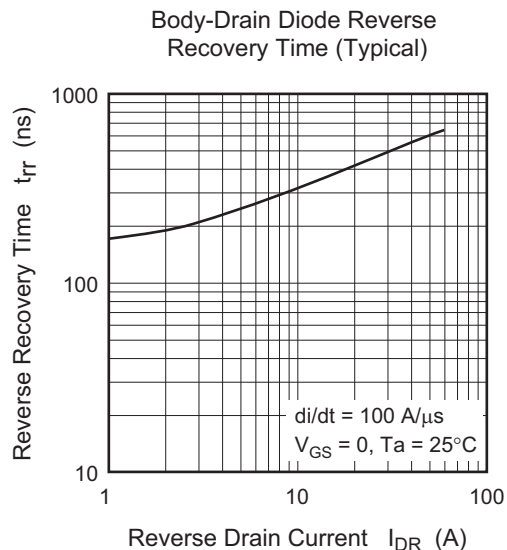
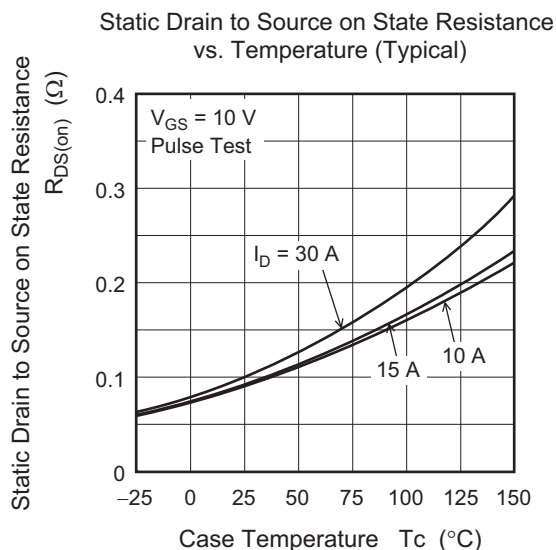
(Ta = 25°C)

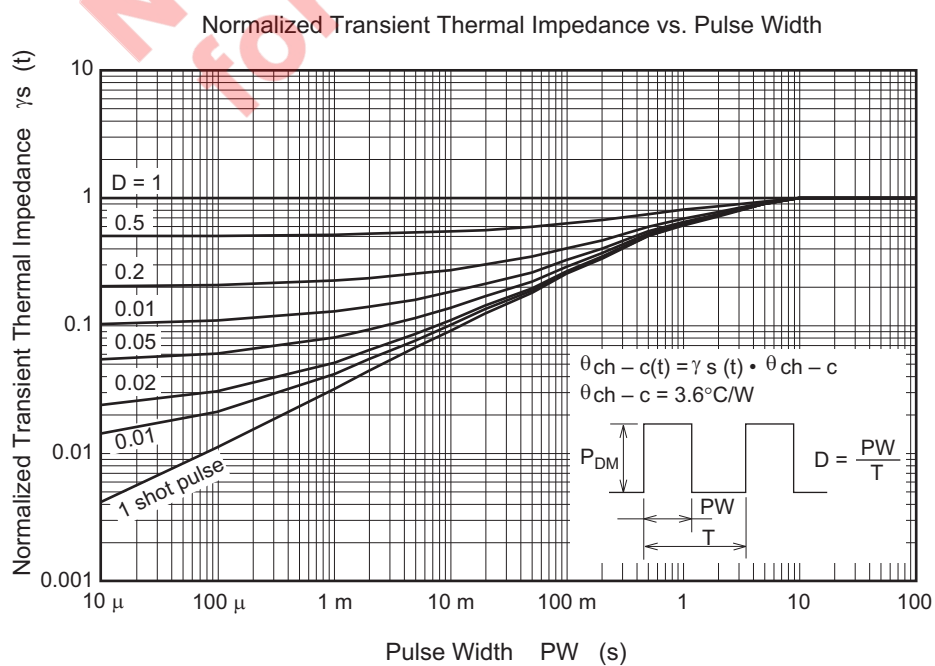
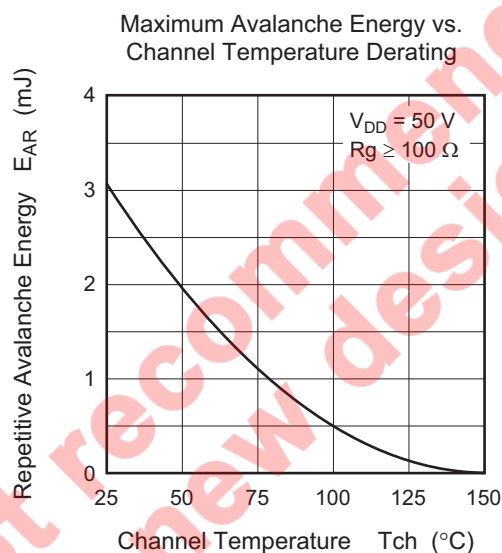
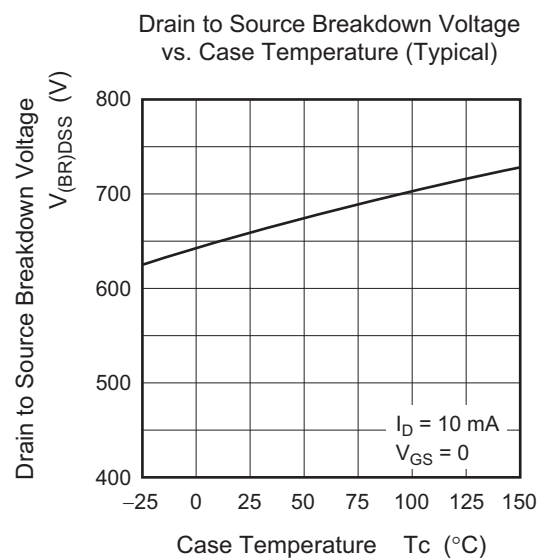
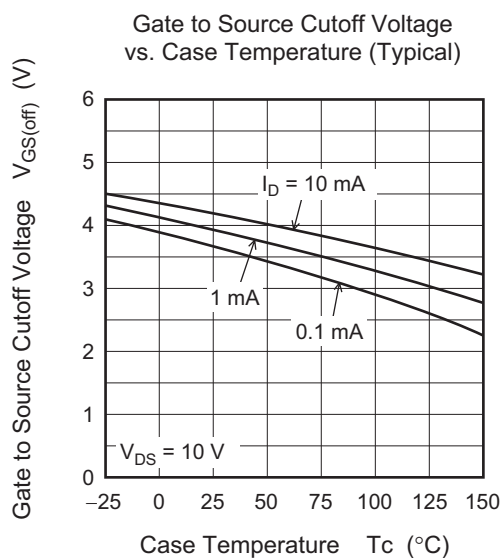
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	600	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	mA	$V_{DS} = 600 \text{ V}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = +30\text{V}$, -20 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	$R_{DS(on)}$	—	0.100	0.125	Ω	$I_D = 15 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4}
	$R_{DS(on)}$	—	0.25	—	Ω	Ta = 150°C $I_D = 15 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4}
Gate resistance	Rg	—	2.0	—	Ω	f = 1 MHz $V_{DS} = 25 \text{ V}$, $V_{GS} = 0$
Input capacitance	Ciss	—	2300	—	pF	$V_{DS} = 25 \text{ V}$ $V_{GS} = 0$ f = 100 kHz
Output capacitance	Coss	—	3000	—	pF	
Reverse transfer capacitance	Crss	—	10	—	pF	
Turn-on delay time	$t_{d(on)}$	—	27	—	ns	$I_D = 15 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 20 \Omega$ Rg = 10 Ω ^{Note4}
Rise time	t_r	—	28	—	ns	
Turn-off delay time	$t_{d(off)}$	—	55	—	ns	
Fall time	t_f	—	9	—	ns	
Total gate charge	Qg	—	39	—	nC	$V_{DD} = 480 \text{ V}$ $V_{GS} = 10 \text{ V}$ $I_D = 30 \text{ A}$ ^{Note4}
Gate to source charge	Qgs	—	15	—	nC	
Gate to drain charge	Qgd	—	11	—	nC	
Body-drain diode forward voltage	V_{DF}	—	1.0	1.6	V	$I_F = 30 \text{ A}$, $V_{GS} = 0$ ^{Note4}
Body-drain diode reverse recovery time	t_{rr}	—	490	—	ns	$I_F = 30 \text{ A}$ $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$ ^{Note4}
Body-drain diode reverse recovery current	I_{rr}	—	26	—	A	
Body-drain diode reverse recovery charge	Q_{rr}	—	7.1	—	μC	

Notes: 4 Pulse test

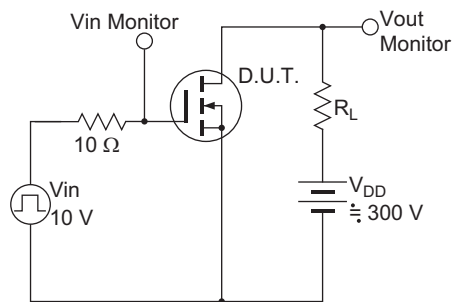
Main Characteristics



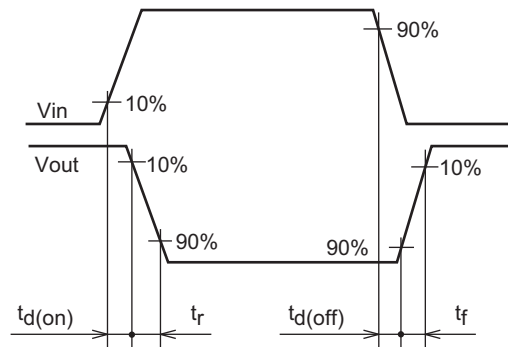




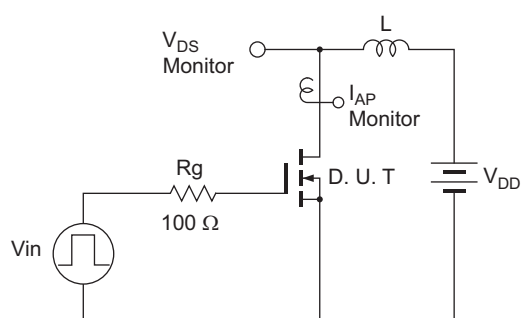
Switching Time Test Circuit



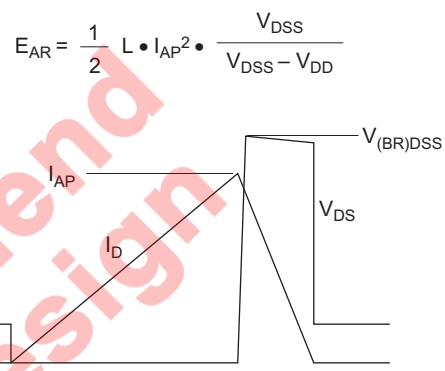
Waveform



Avalanche Test Circuit



Avalanche Waveform

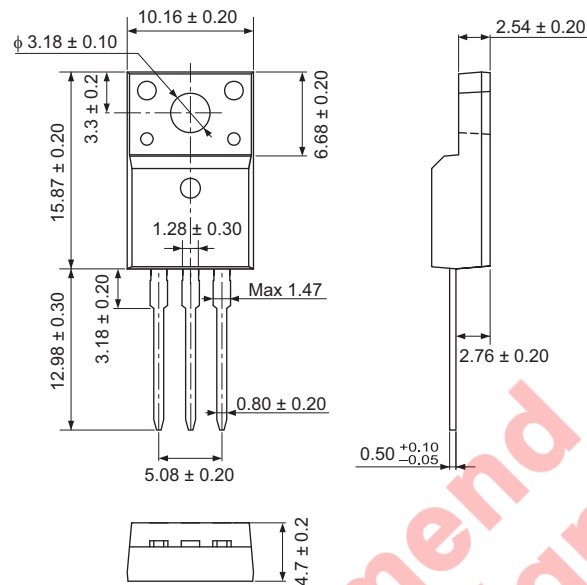


Not recommended
for new design

Package Dimension

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
RJK60S7DPP-E0#T2	1000 pcs	Box (Tube)

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