

RJK0631JPR

60 V - 30 A - N Channel Power MOS FET
High Speed Power Switching

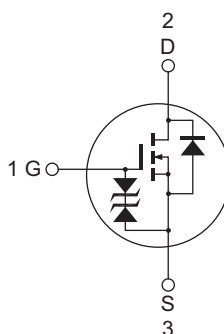
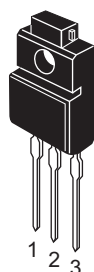
R07DS0879EJ0300
Rev.3.00
Jul 24, 2013

Features

- For Automotive application
- AEC-Q101 compliant
- Low on-resistance : $R_{DS(on)} = 12 \text{ m}\Omega$ typ.
- Capable of 4.5 V gate drive
- Low input capacitance: $C_{iss} = 1350 \text{ pF}$ typ

Outline

RENESAS Package code: PRSS0003AD-A
(Package name: TO-220FM)



1. Gate
2. Drain
3. Source

Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

Item	Symbol	Value	Unit
Drain to source voltage	V_{DSS}	60	V
Gate to source voltage	V_{GSS}	± 20	V
Drain current	I_D	30	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	120	A
Body-drain diode reverse drain current	I_{DR}	30	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ ^{Note1}	120	A
Avalanche current	I_{AP} ^{Note2}	27	A
Avalanche energy	E_{AR} ^{Note2}	62.5	mJ
Channel dissipation	P_{ch} ^{Note3}	30	W
Channel temperature	T_{ch} ^{Note4}	175	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

- Notes: 1. $PW \leq 10\mu\text{s}$ duty cycle $\leq 1\%$
 2. $T_{ch} = 25^\circ\text{C}$, $R_g \geq 50 \Omega$
 3. $T_c = 25^\circ\text{C}$
 4. AEC-Q101 compliant

Thermal Impedance Characteristics

- Channel to case thermal impedance θ_{ch-c} : 5.00°C/W

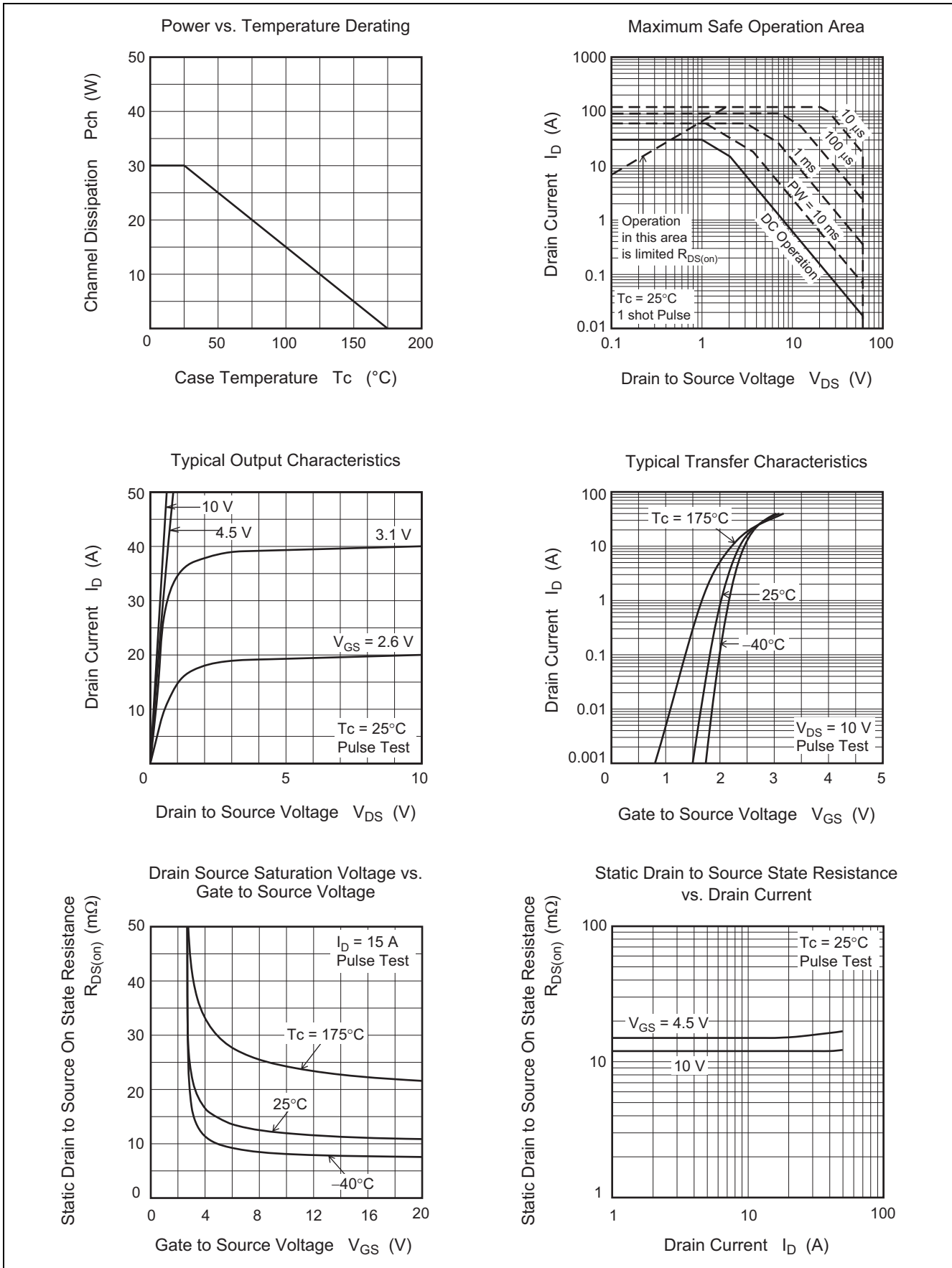
Electrical Characteristics

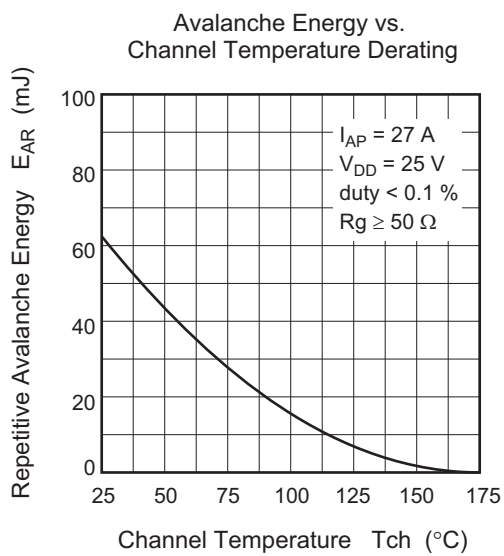
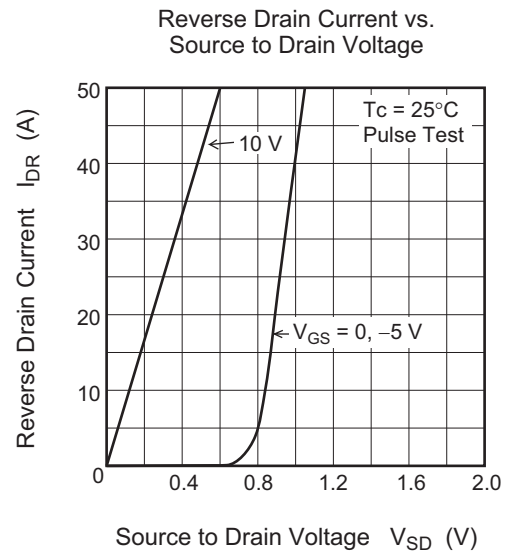
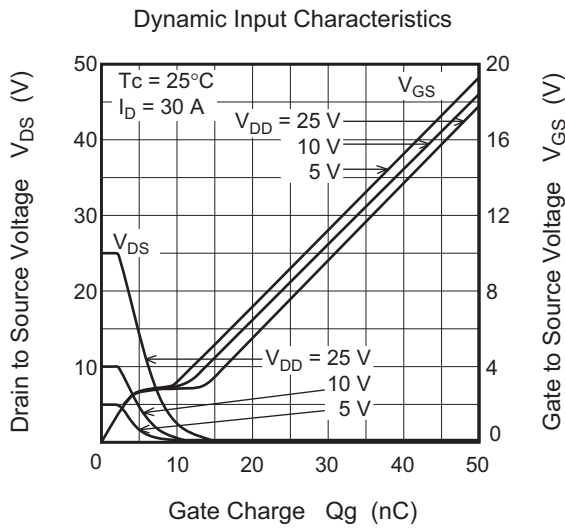
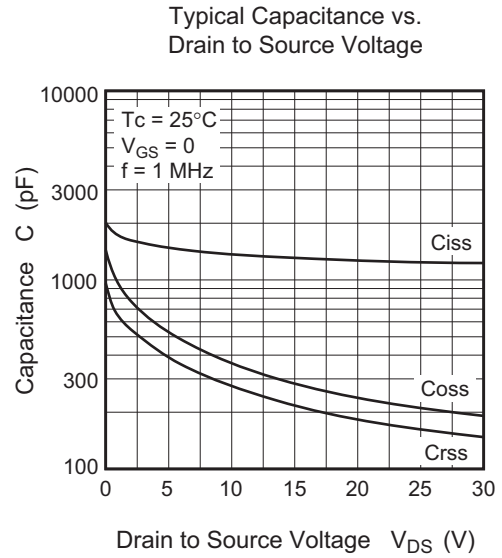
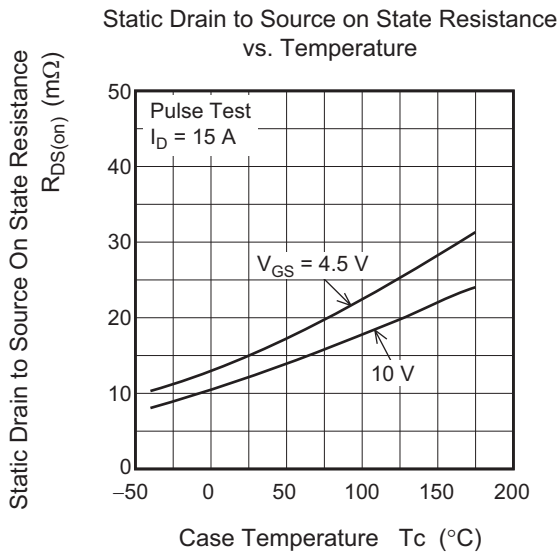
(Ta = 25°C)

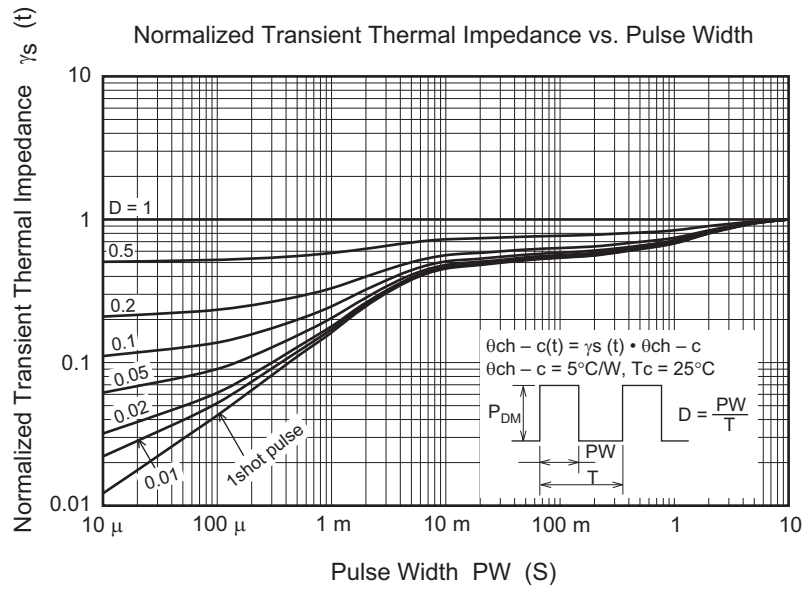
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Gate to source leak current	I_{GSS}	—	—	±10	μA	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 60\text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.0	V	$I_D = 1\text{ mA}, V_{DS} = 10\text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	12	15	mΩ	$I_D = 15\text{ A}, V_{GS} = 10\text{ V}$ ^{Note5}
		—	15	20	mΩ	$I_D = 15\text{ A}, V_{GS} = 4.5\text{ V}$ ^{Note5}
Input capacitance	C_{iss}	—	1350	—	pF	$V_{DS} = 10\text{ V}, V_{GS} = 0,$ $f = 1\text{ MHz}$
Output capacitance	C_{oss}	—	360	—	pF	
Reverse transfer capacitance	C_{rss}	—	270	—	pF	
Total gate charge	Q_g	—	32	—	nC	$V_{DD} = 25\text{ V}, V_{GS} = 10\text{ V},$ $I_D = 30\text{ A}$
Gate to source charge	Q_{gs}	—	3.6	—	nC	
Gate to drain charge	Q_{gd}	—	10	—	nC	
Turn-on delay time	$t_{d(on)}$	—	13	—	ns	$I_D = 15\text{ A}, R_L = 2\ \Omega,$ $V_{GS} = 10\text{ V}, R_G = 4.7\ \Omega$
Rise time	t_r	—	15	—	ns	
Turn-off delay time	$t_{d(off)}$	—	60	—	ns	
Fall time	t_f	—	15	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.94	1.17	V	$I_F = 30\text{ A}, V_{GS} = 0$ ^{Note5}
Body-drain diode reverse recovery time	t_{rr}	—	40	—	ns	$I_F = 30\text{ A}, V_{GS} = 0$ $di_F/dt = 100\text{ A}/\mu\text{s}$

Note: 5. Pulse test

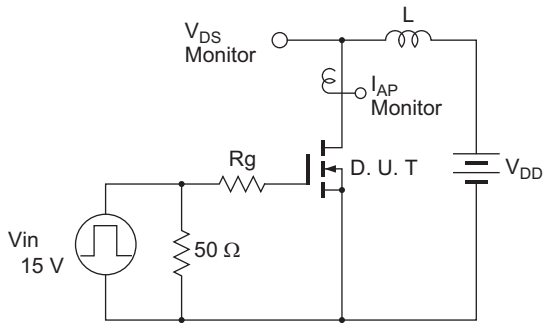
Main Characteristics





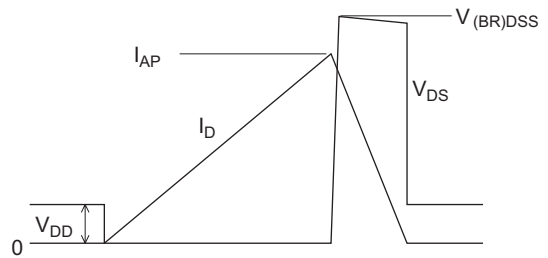


Avalanche Test Circuit

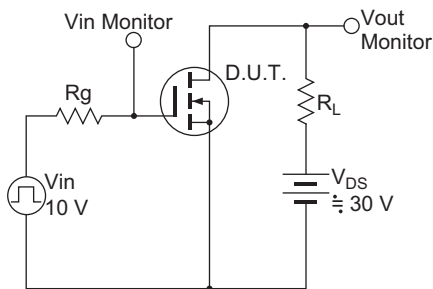


Avalanche Waveform

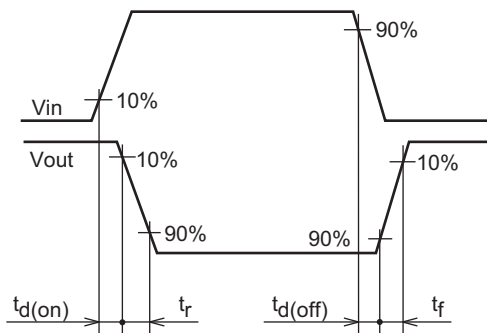
$$E_{AR} = \frac{1}{2} L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



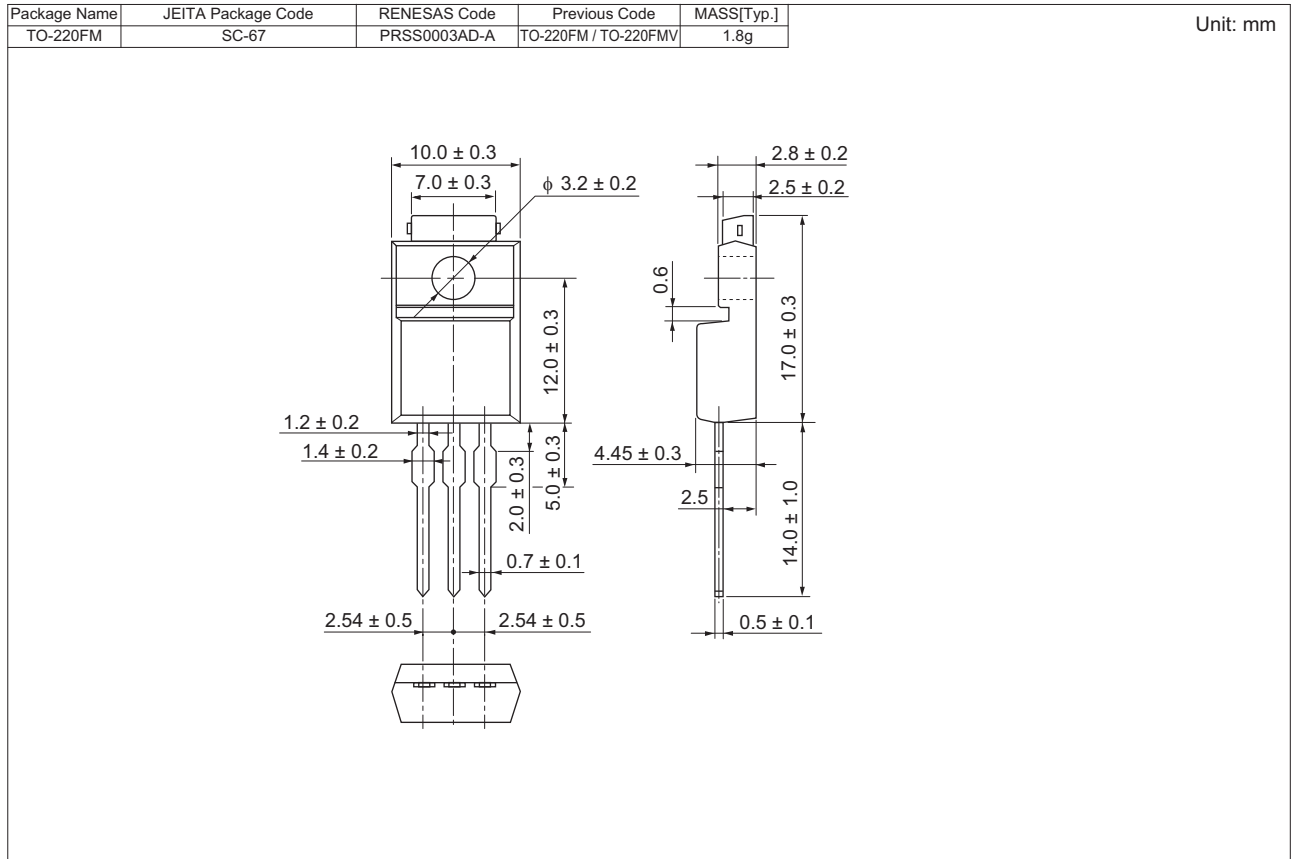
Switching Time Test Circuit



Switching Time Waveform



Package Dimensions



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJK0631JPR-00-T2	600 pcs	Box (Tube)

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

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