

# RJK60S7DPP-E0

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

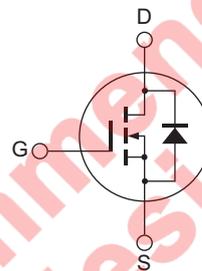
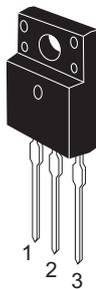
R07DS0643EJ0300  
Rev.3.00  
Dec 10, 2012

## 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	$T_c = 25^\circ C$	$I_D$ <sup>Note1</sup>	30
	$T_c = 100^\circ C$	$I_D$ <sup>Note1</sup>	19
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	60	A
Body-drain diode reverse drain current	$I_{DR}$ <sup>Note1</sup>	30	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ <sup>Note1</sup>	60	A
Avalanche current	$I_{AP}$ <sup>Note2</sup>	7.5	A
Avalanche energy	$E_{AR}$ <sup>Note2</sup>	3.06	mJ
Channel dissipation	$P_{ch}$ <sup>Note3</sup>	34.7	W
Channel to case thermal impedance	$\theta_{ch-c}$	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  $T_c = 25^\circ C$

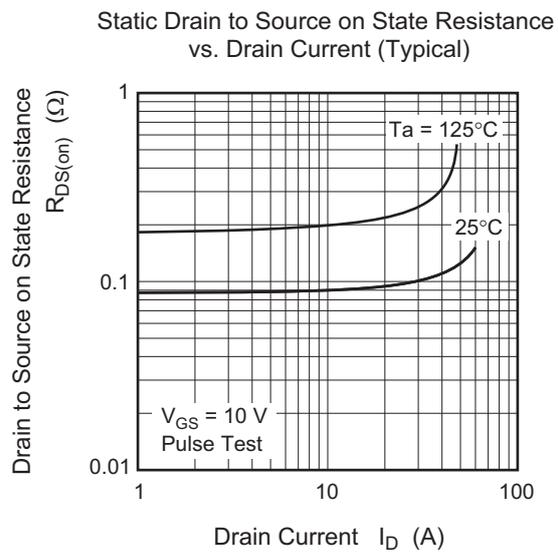
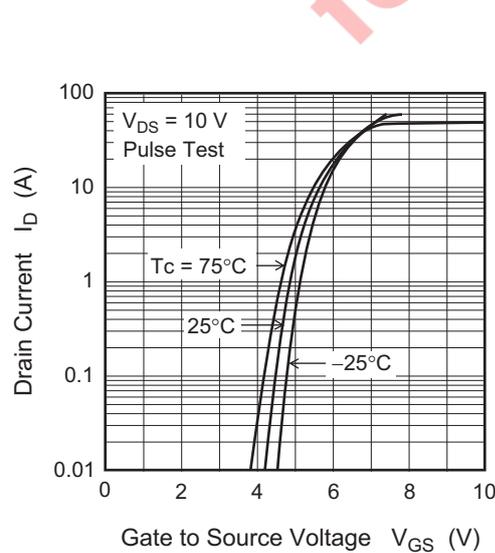
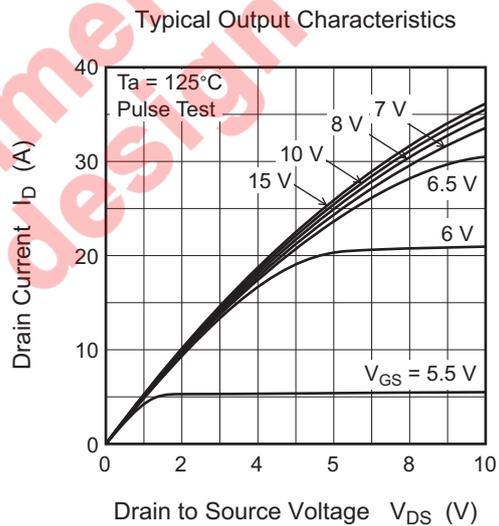
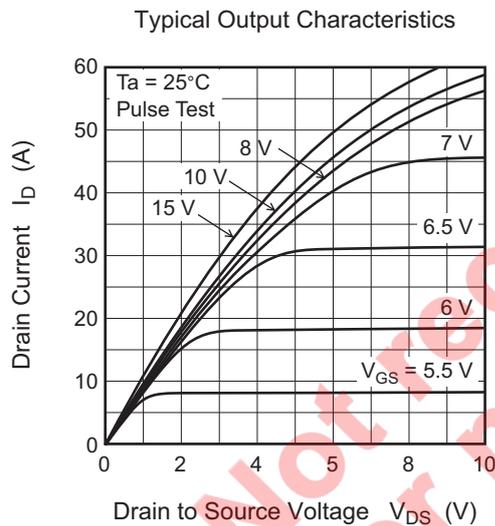
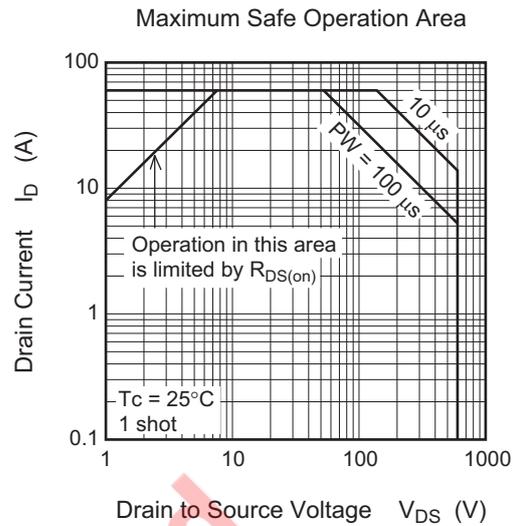
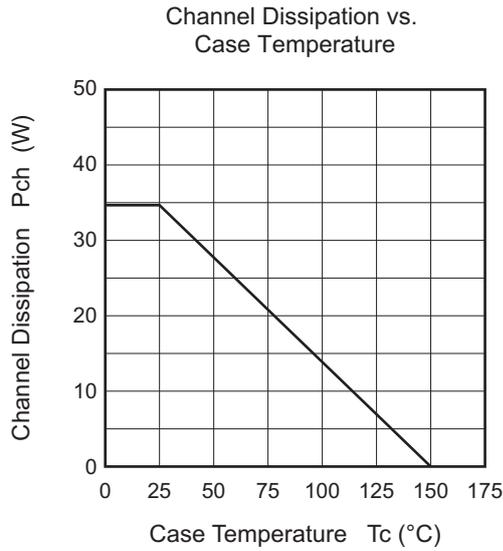
## Electrical Characteristics

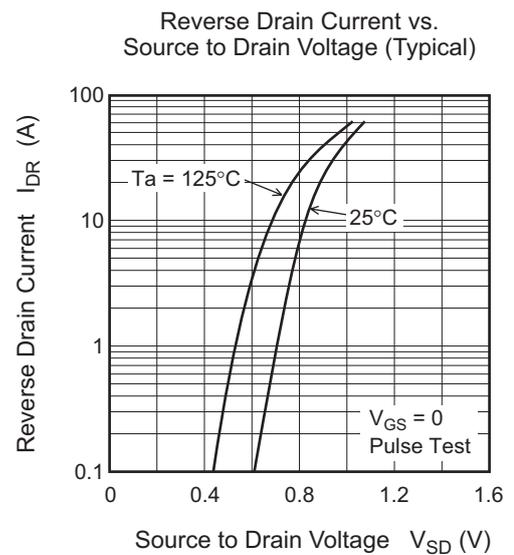
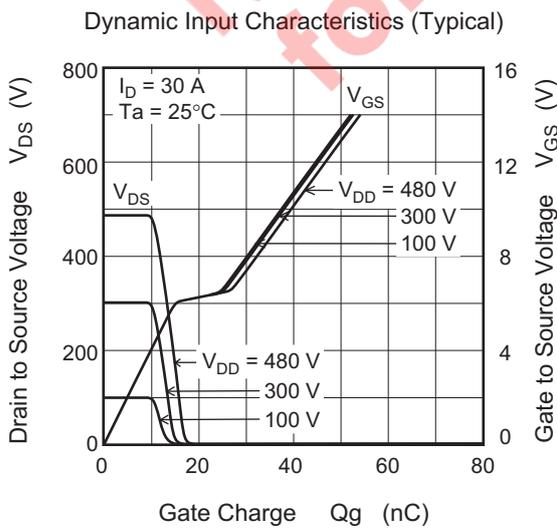
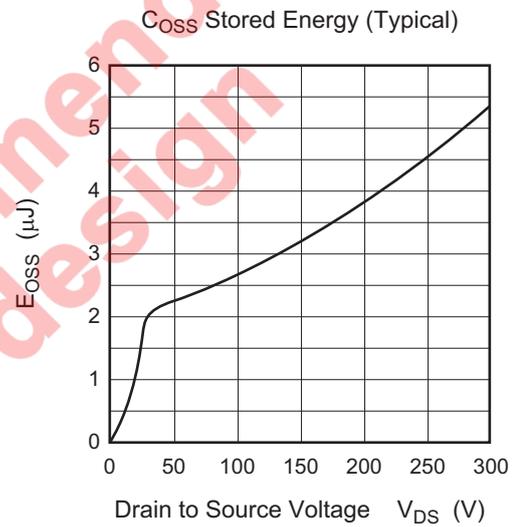
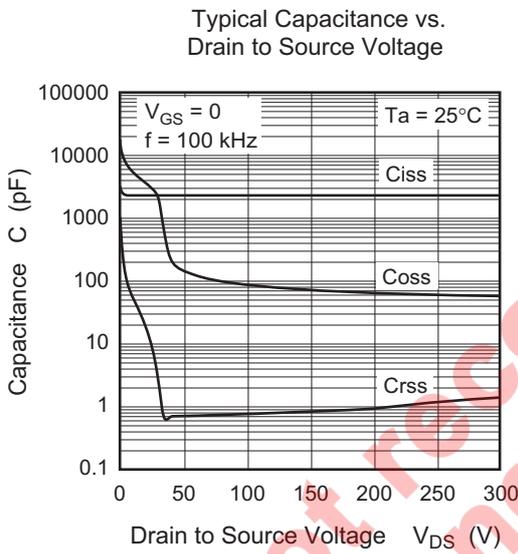
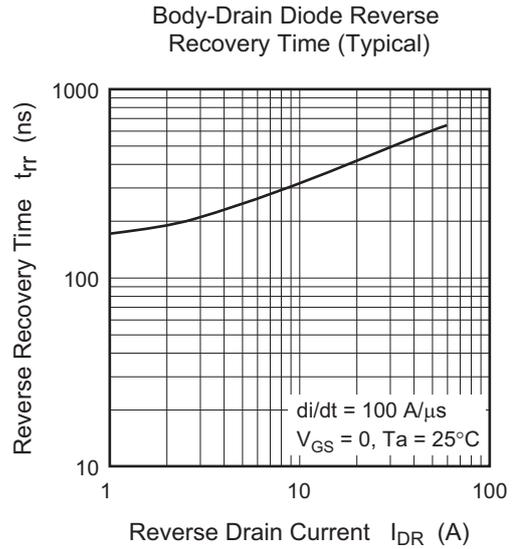
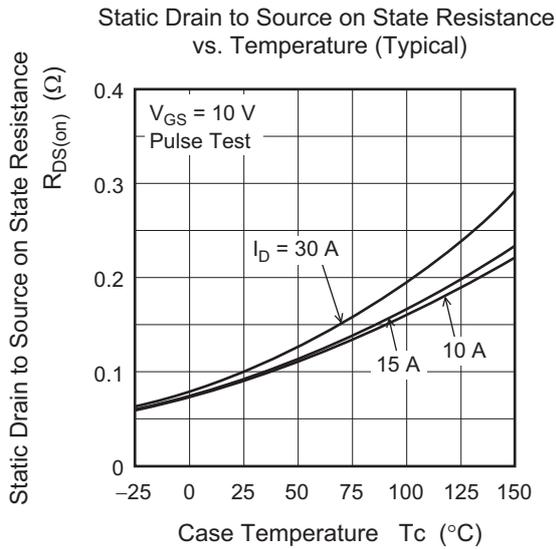
(Ta = 25°C)

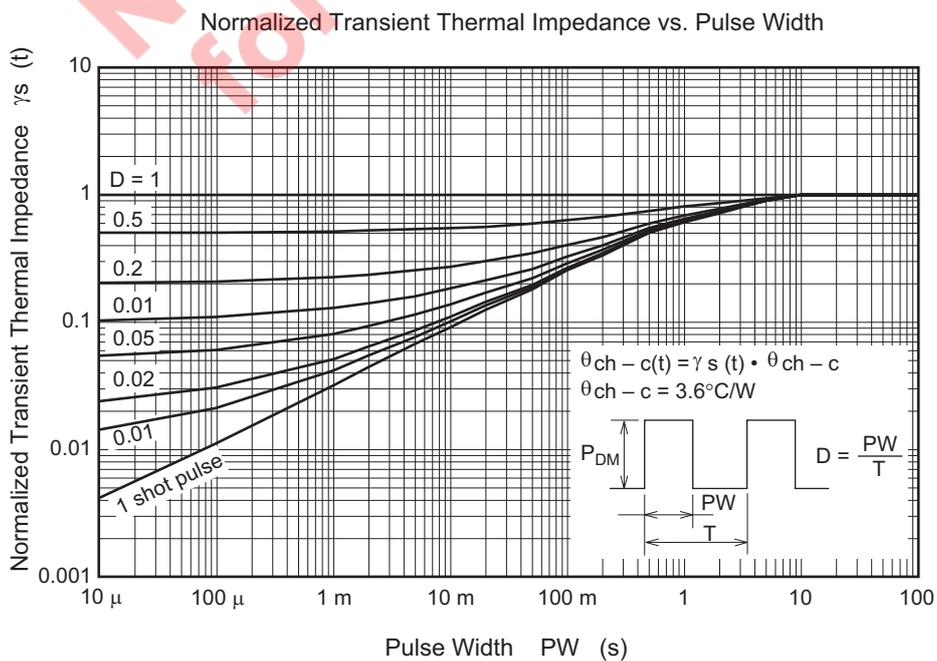
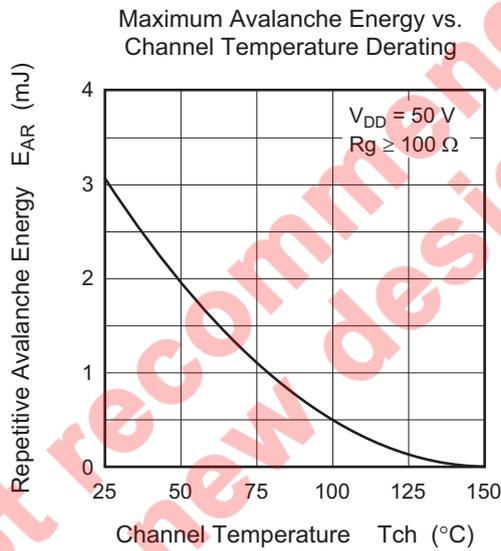
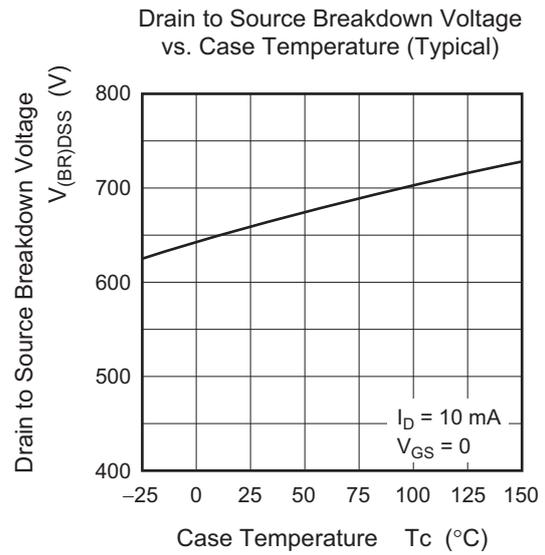
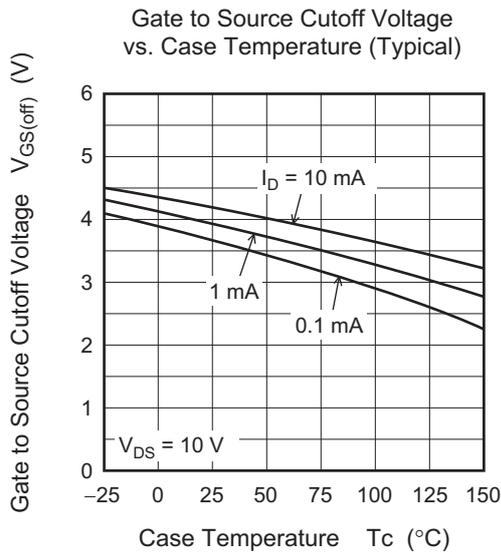
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	600	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	mA	$V_{DS} = 600 \text{ V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = +30\text{V}$ , $-20 \text{ V}$ , $V_{DS} = 0$
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	$R_{DS(on)}$	—	0.100	0.125	$\Omega$	$I_D = 15 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
	$R_{DS(on)}$	—	0.25	—	$\Omega$	Ta = 150°C $I_D = 15 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
Gate resistance	Rg	—	2.0	—	$\Omega$	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 $\Omega$ <sup>Note4</sup>
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	$V_{DD} = 480 \text{ V}$
Gate to source charge	Qgs	—	15	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	Qgd	—	11	—	nC	$I_D = 30 \text{ A}$ <sup>Note4</sup>
Body-drain diode forward voltage	$V_{DF}$	—	1.0	1.6	V	$I_F = 30 \text{ A}$ , $V_{GS} = 0$ <sup>Note4</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	490	—	ns	$I_F = 30 \text{ A}$ $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{S}$ <sup>Note4</sup>
Body-drain diode reverse recovery current	$I_{rr}$	—	26	—	A	
Body-drain diode reverse recovery charge	Q <sub>rr</sub>	—	7.1	—	$\mu\text{C}$	

Notes: 4 Pulse test

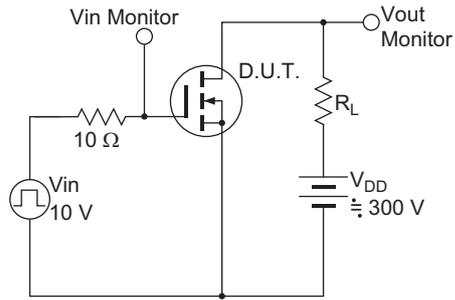
### Main Characteristics



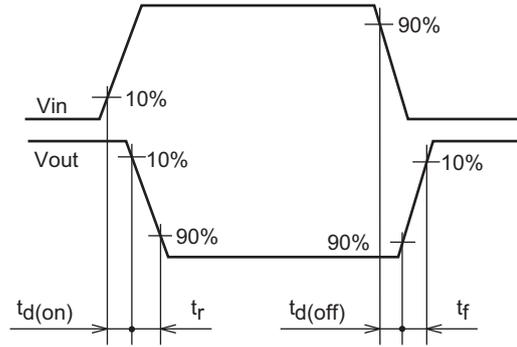




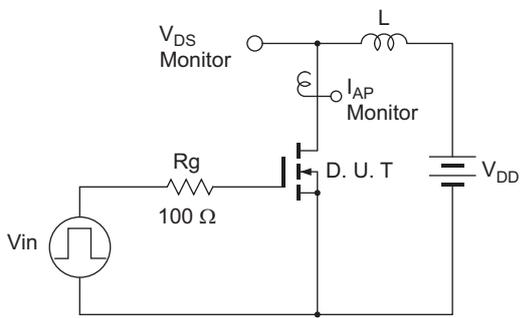
Switching Time Test Circuit



Waveform

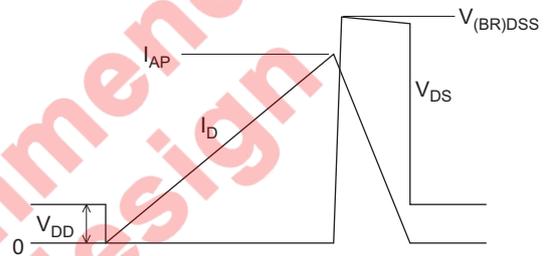


Avalanche Test Circuit



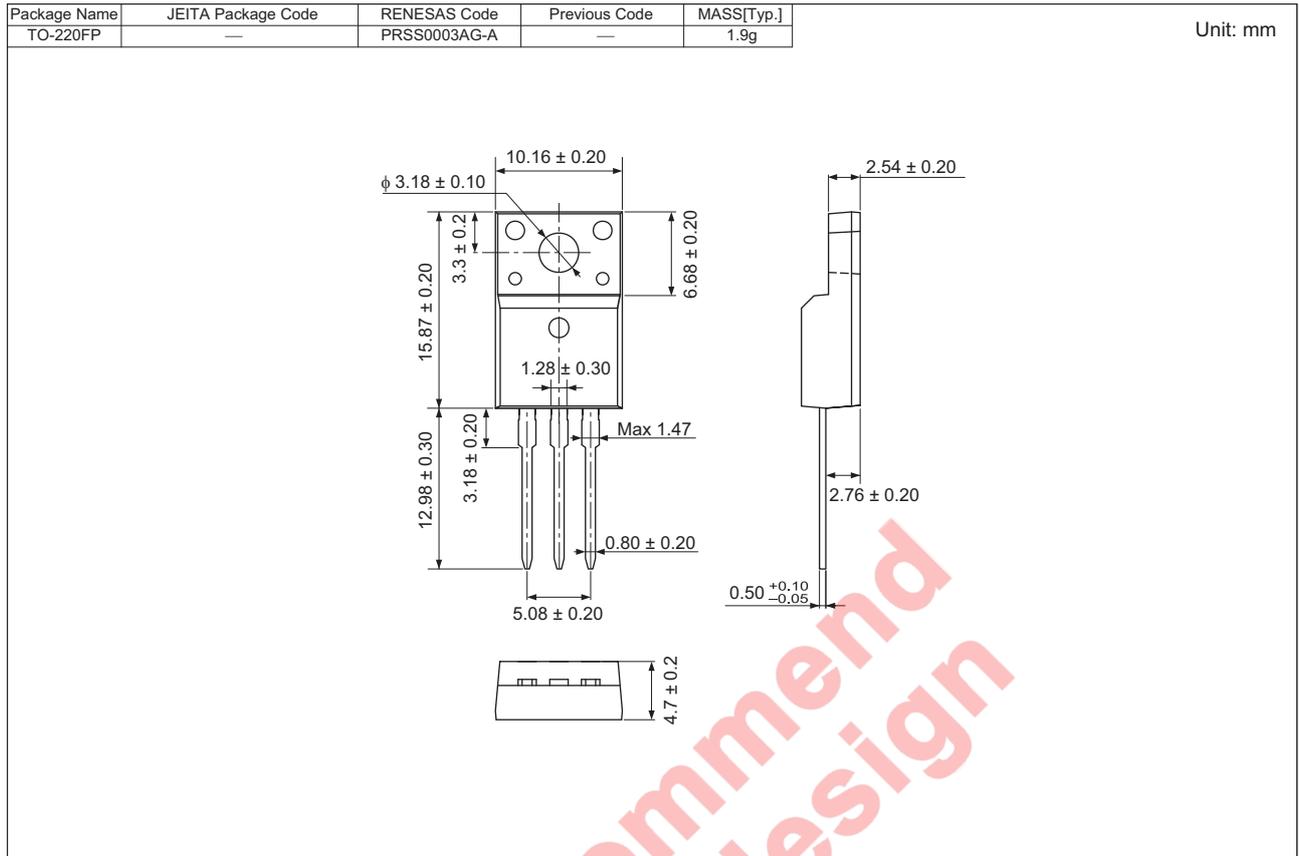
Avalanche Waveform

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



Not recommended for new design

Package Dimension



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJK60S7DPP-E0#T2	1000 pcs	Box (Tube)

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