

RJK60S7DPQ-E0

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

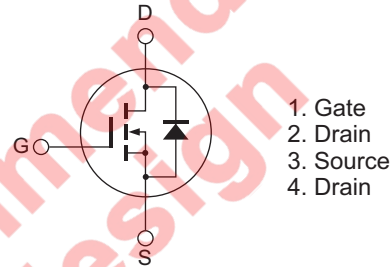
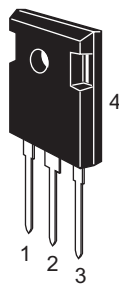
R07DS0736EJ0300
Rev.3.00
Dec 10, 2012

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: PRSS0003ZE-A
(Package name: TO-247)



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^{Note1}	30
	$T_c = 100^\circ C$	I_D^{Note1}	19
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}	227.2	W
Channel to case thermal impedance	θ_{ch-c}	0.55	$^\circ C/W$
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 $T_c = 25^\circ C$

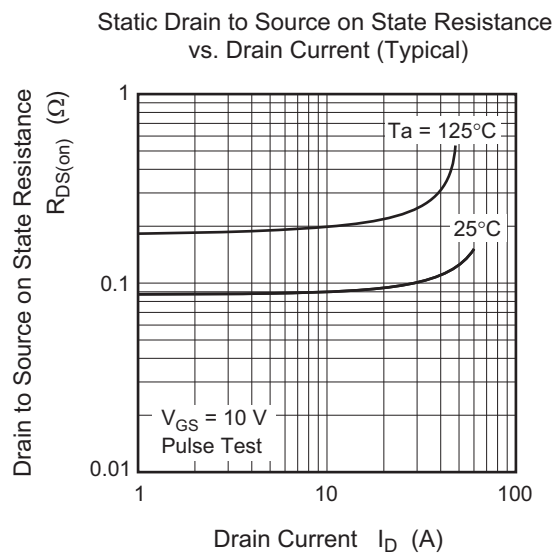
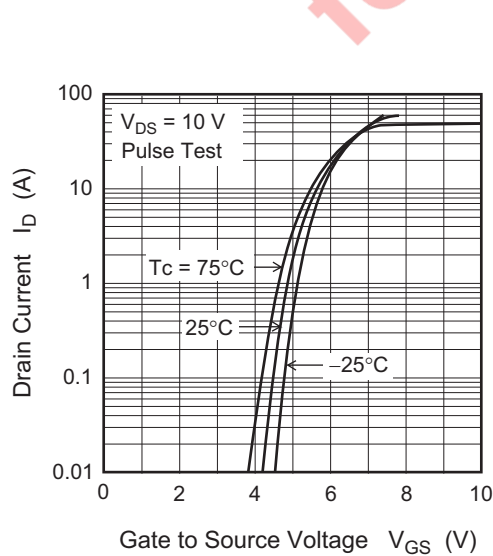
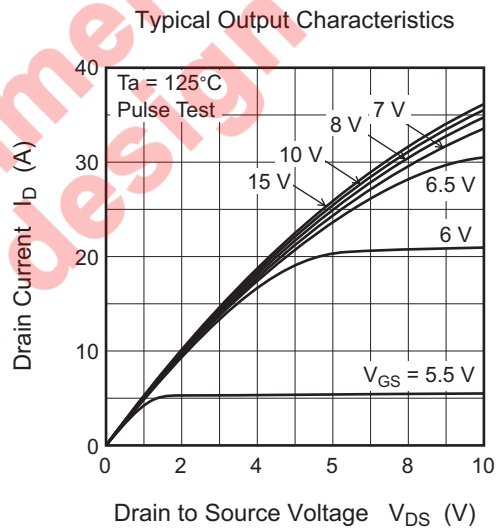
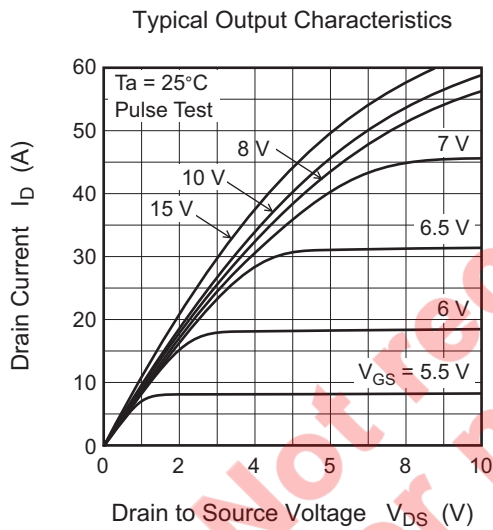
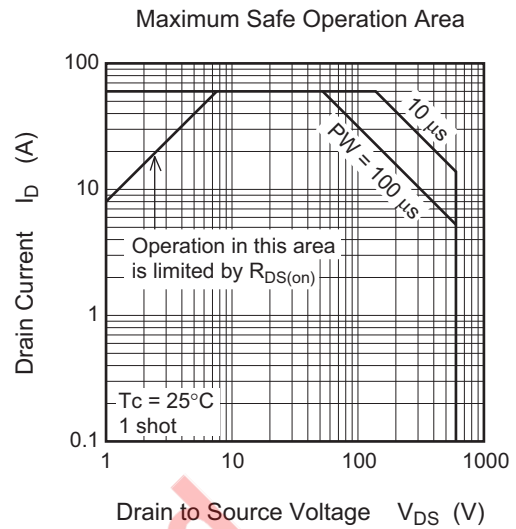
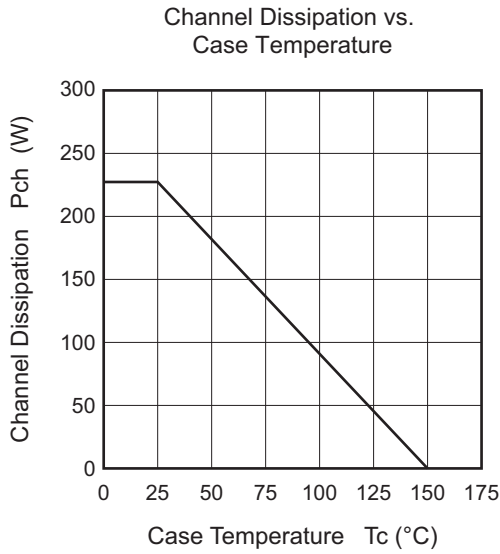
Electrical Characteristics

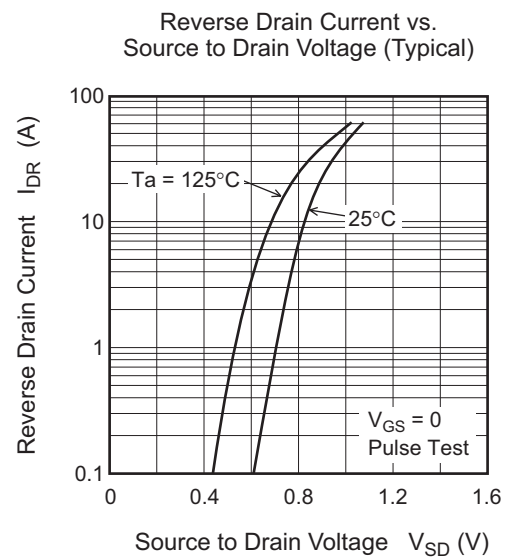
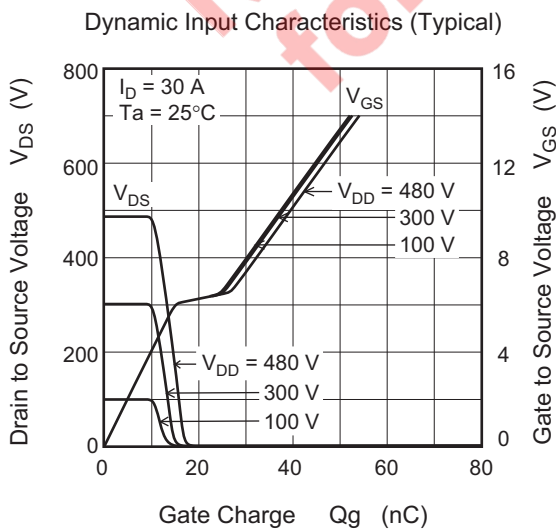
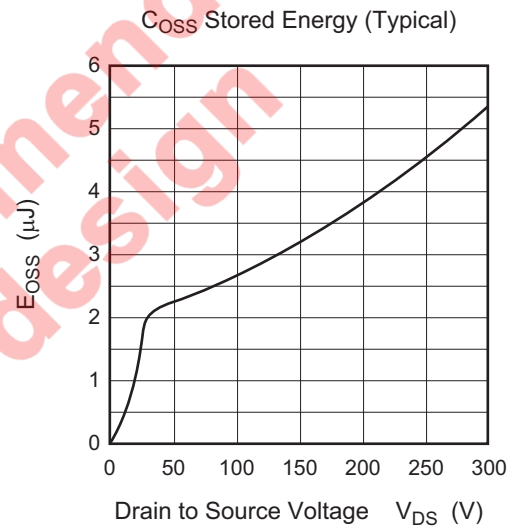
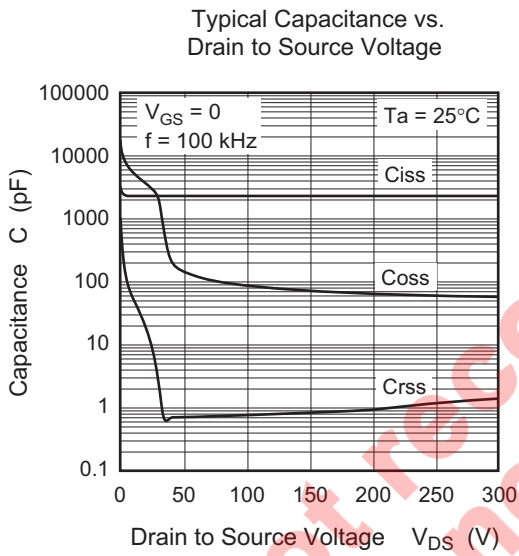
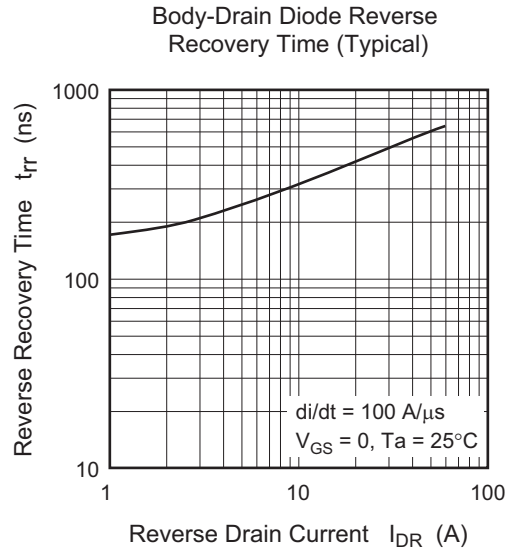
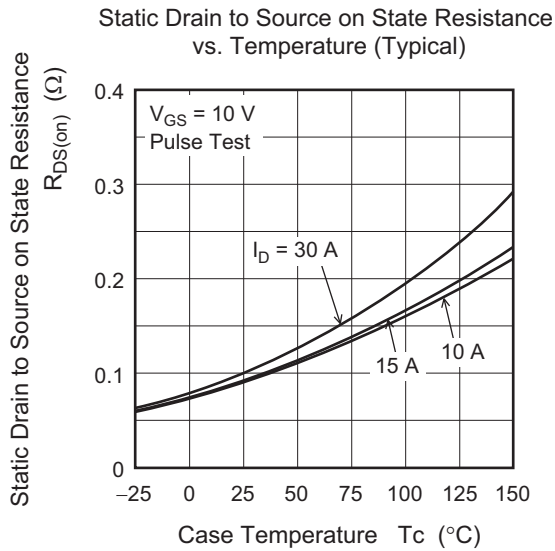
(Ta = 25°C)

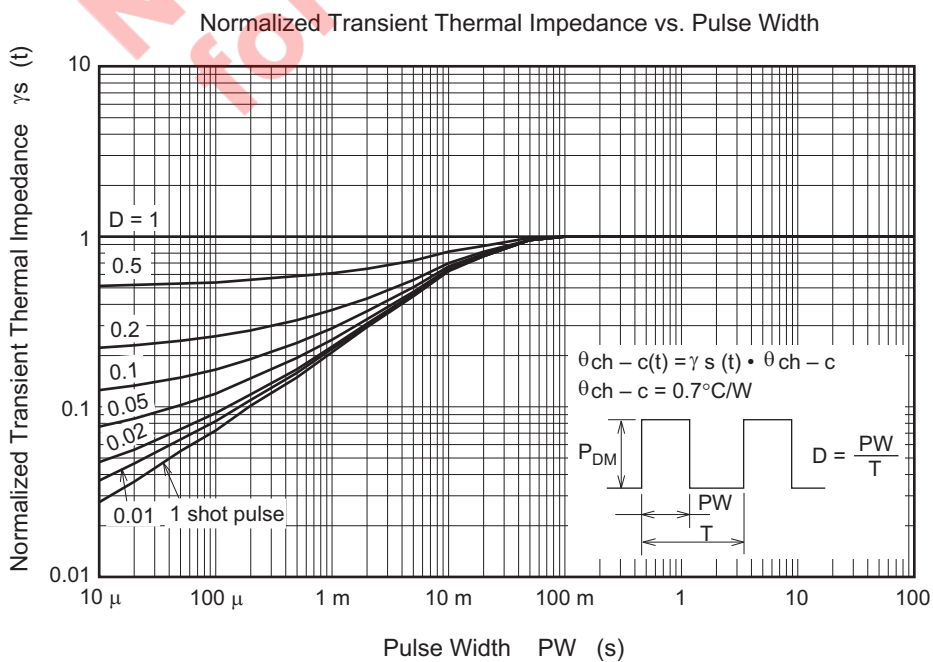
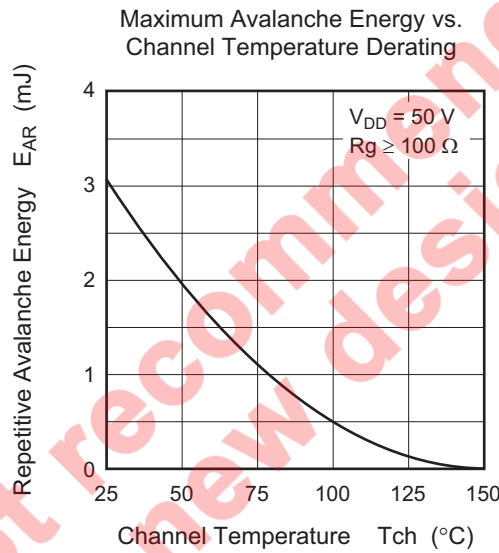
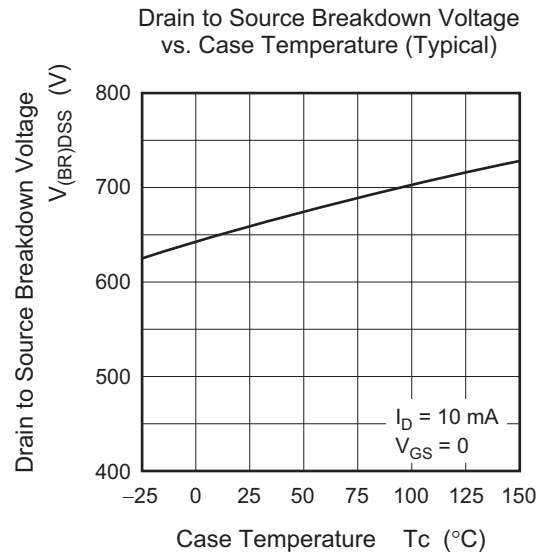
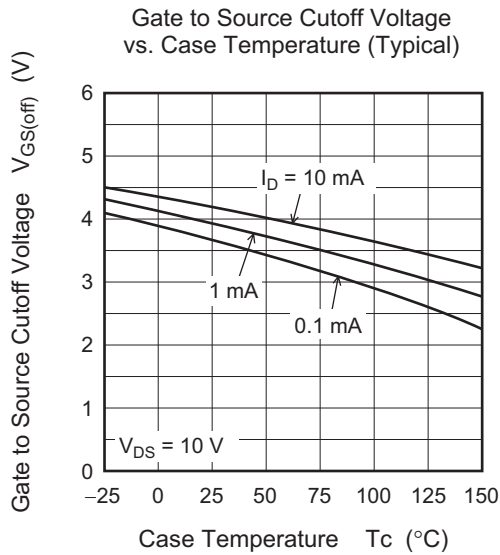
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	600	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	mA	$V_{DS} = 600 \text{ V}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = +30\text{V}$, -20 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	$V_{DD} = 480 \text{ V}$
Gate to source charge	Qgs	—	15	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	Qgd	—	11	—	nC	$I_D = 30 \text{ A}$ ^{Note4}
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

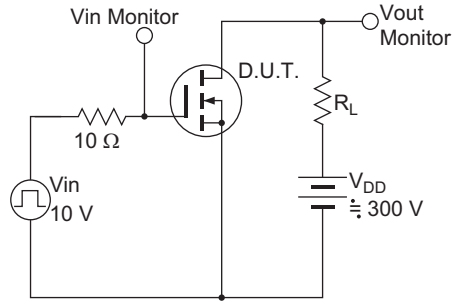
Main Characteristics



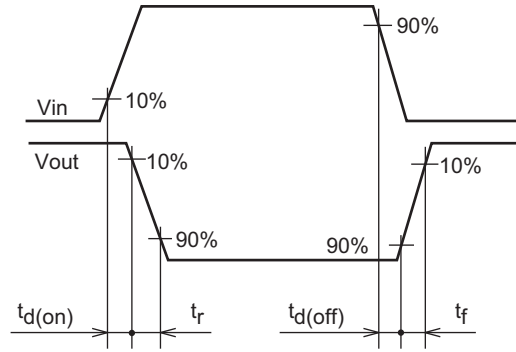




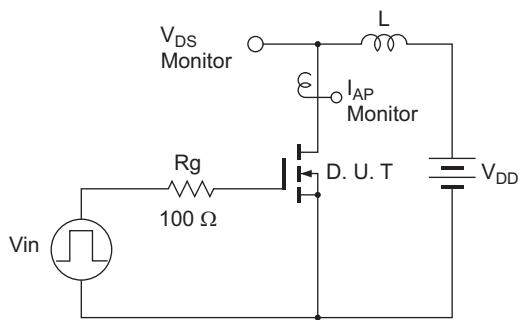
Switching Time Test Circuit



Waveform

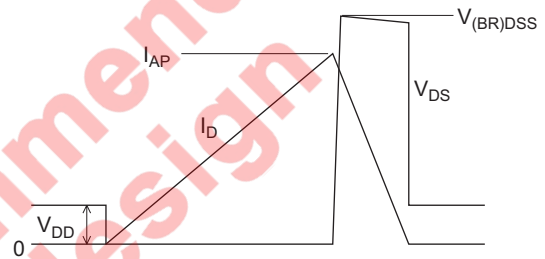


Avalanche Test Circuit



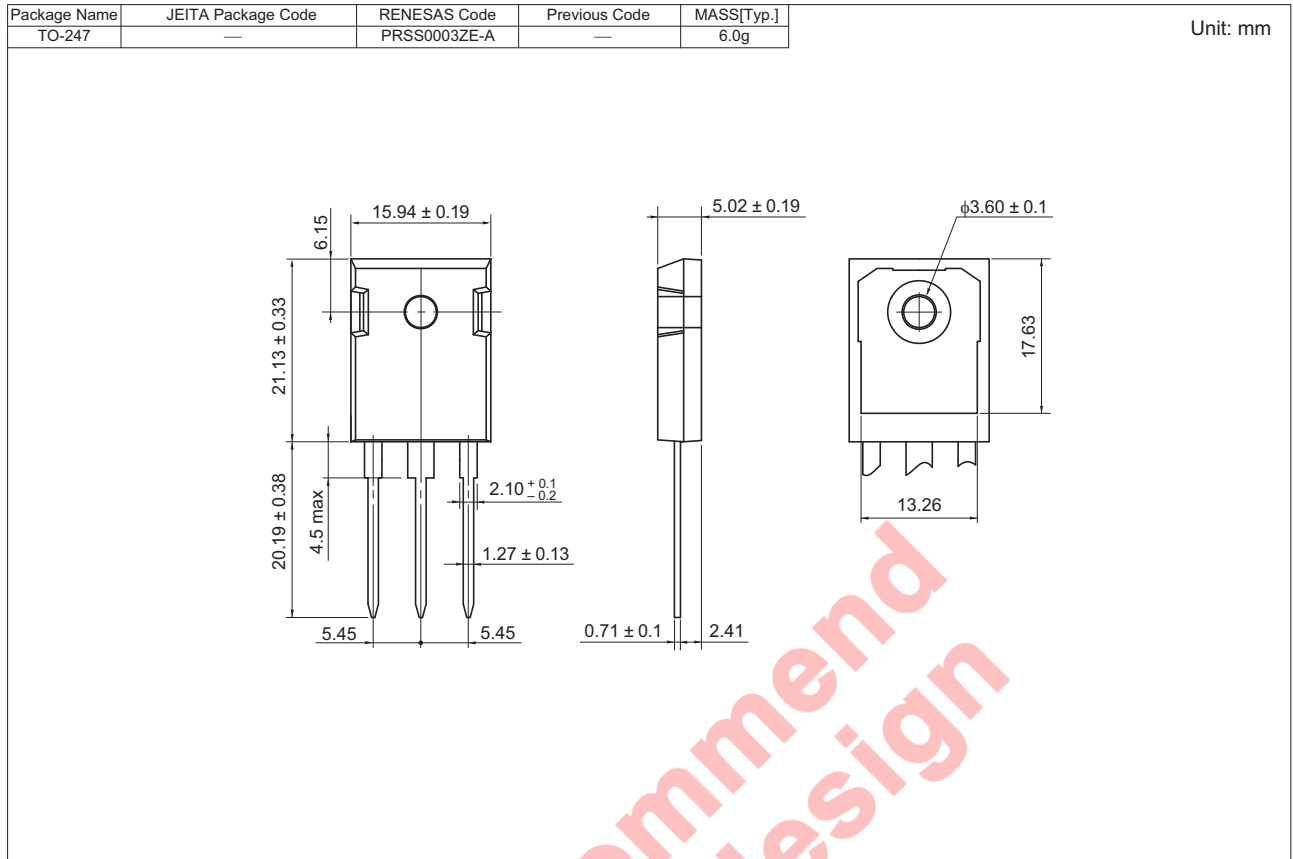
Avalanche Waveform

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



Not recommended for new design

Package Dimension



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJK60S7DPQ-E0#T2	240 pcs	Box (Tube)

Not recommend
for new design

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