

RJK03C1DPB

Silicon N Channel Power MOS FET with Schottky Barrier Diode Power Switching

REJ03G1830-0310

Rev.3.10

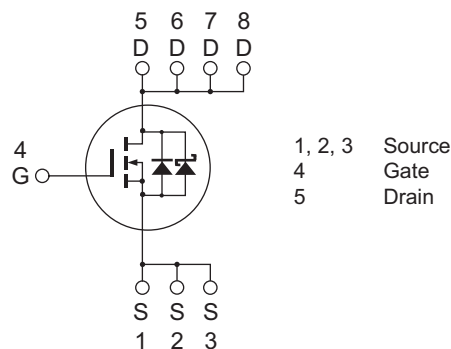
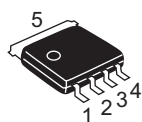
Sep 29, 2009

Features

- High speed switching
- Capable of 4.5 V gate drive
- Low drive current
- High density mounting
- Low on-resistance
 $R_{DS(on)} = 1.7 \text{ m}\Omega$ typ. (at $V_{GS} = 10 \text{ V}$)
- Pb-free
- Halogen-free

Outline

RENESAS Package code: PTZZ0005DA-A
(Package name: LPAK)



Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	30	V
Gate to source voltage	V_{GSS}	± 20	V
Drain current	I_D	60	A
Drain peak current	$I_{D(pulse)}$ ^{Note 1}	240	A
Body-drain diode reverse drain current	I_{DR}	60	A
Avalanche current	I_{AP} ^{Note 2}	28	A
Avalanche energy	E_{AR} ^{Note 2}	78.4	mJ
Channel dissipation	P_{ch} ^{Note 3}	65	W
Channel to Case Thermal Resistance	θ_{ch-C}	1.92	°C/W
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$
2. Value at $T_{ch} = 25^\circ C$, $R_g \geq 50 \Omega$
3. $T_c = 25^\circ C$

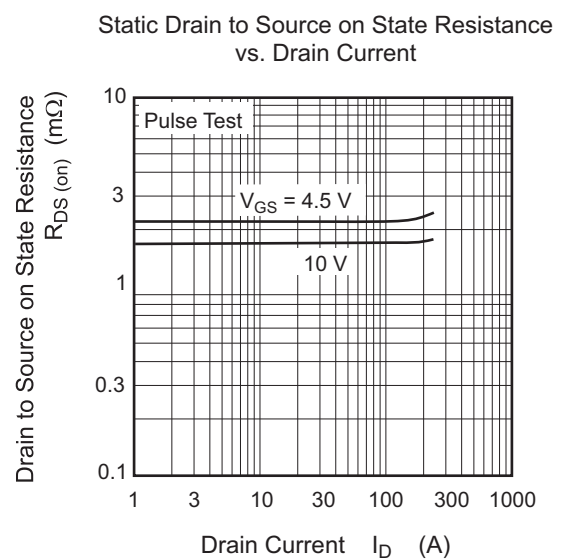
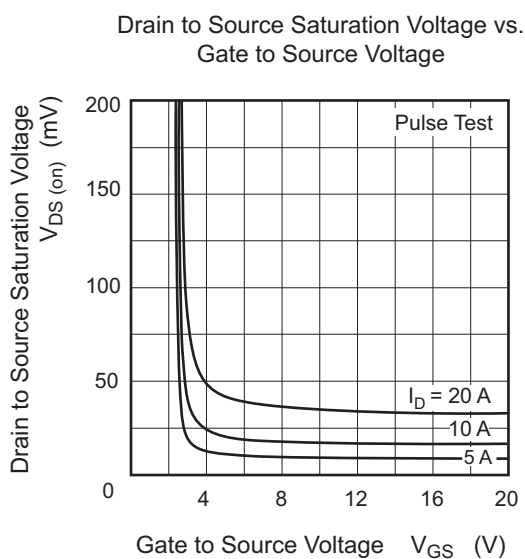
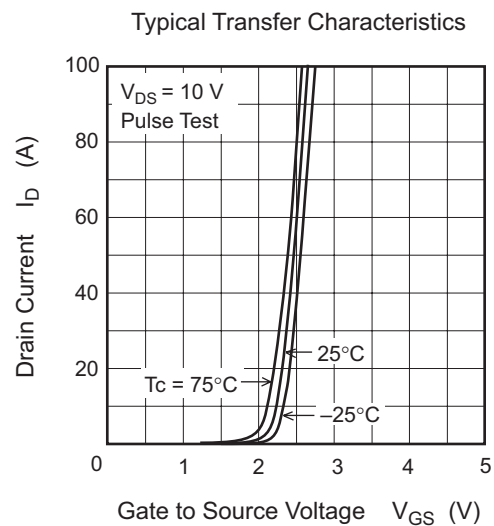
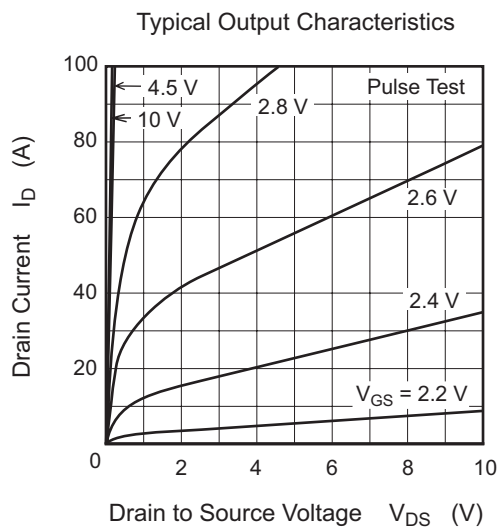
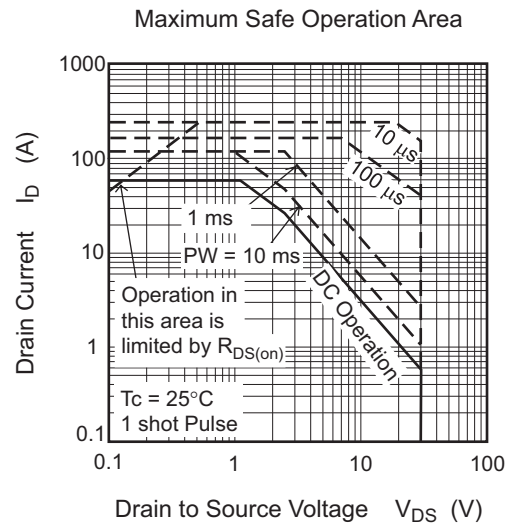
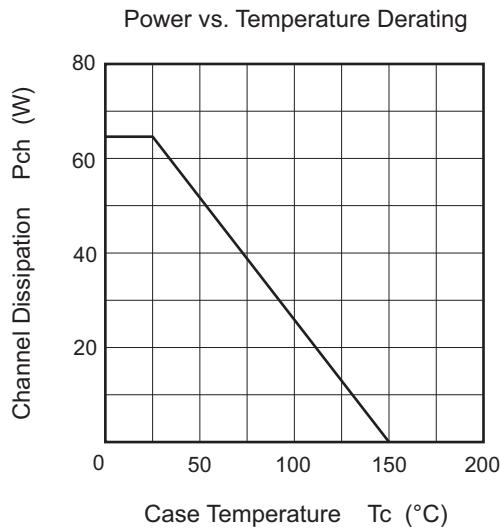
Electrical Characteristics

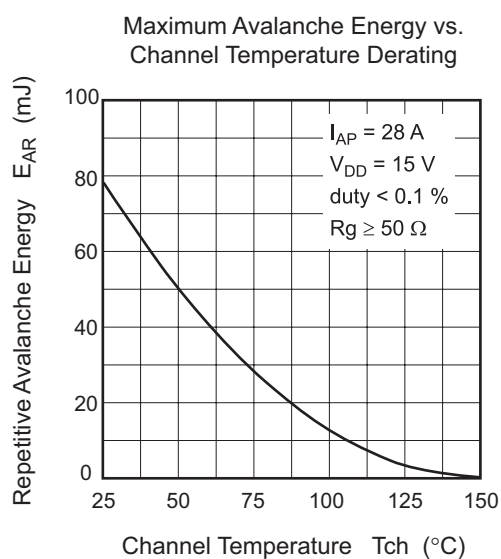
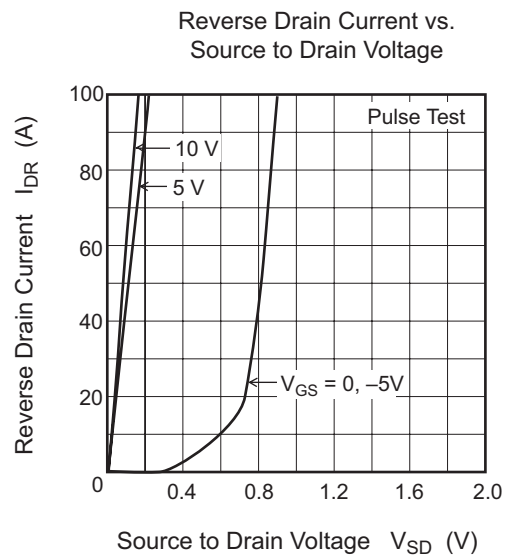
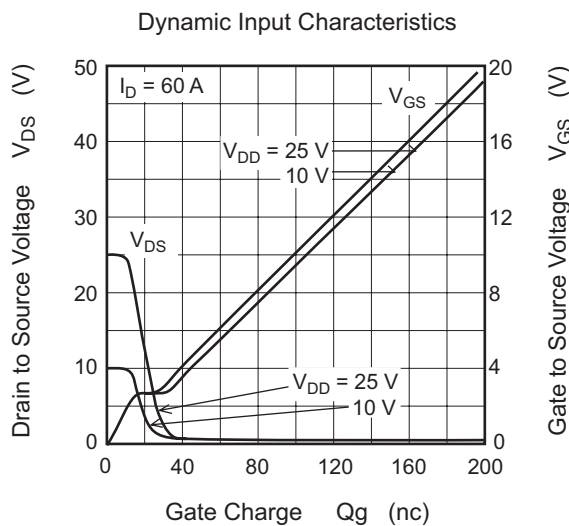
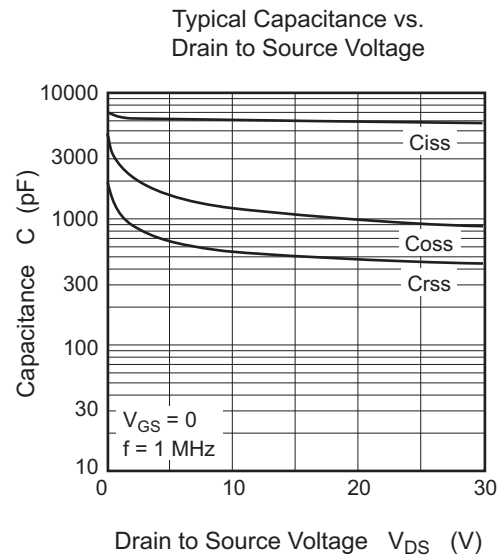
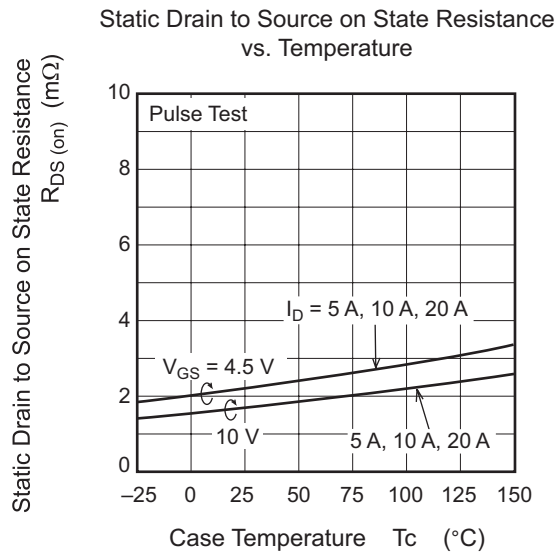
(Ta = 25°C)

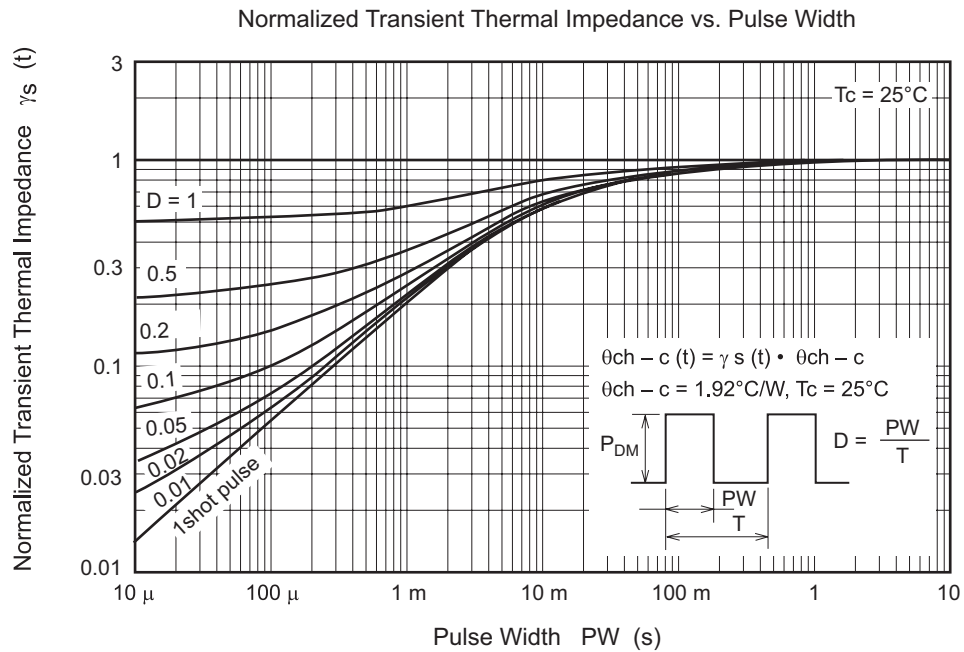
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.5	μA	$V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	m A	$V_{DS} = 30 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.2	—	2.5	V	$V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	1.7	2.2	$\text{m}\Omega$	$I_D = 30 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4}
	$R_{DS(on)}$	—	2.2	3.1	$\text{m}\Omega$	$I_D = 30 \text{ A}$, $V_{GS} = 4.5 \text{ V}$ ^{Note4}
Forward transfer admittance	$ y_{fs} $	—	120	—	S	$I_D = 30 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note4}
Input capacitance	C_{iss}	—	6000	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	1230	—	pF	
Reverse transfer capacitance	C_{rss}	—	550	—	pF	
Gate Resistance	R_g	—	0.5	—	Ω	
Total gate charge	Q_g	—	42	—	nC	$V_{DD} = 10 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 60 \text{ A}$
Gate to source charge	Q_{gs}	—	18	—	nC	
Gate to drain charge	Q_{gd}	—	16	—	nC	
Turn-on delay time	$t_{d(on)}$	—	18	—	ns	$V_{GS} = 10 \text{ V}$, $I_D = 30 \text{ A}$, $V_{DD} \cong 10 \text{ V}$, $R_L = 0.33 \Omega$, $R_g = 4.7 \Omega$
Rise time	t_r	—	19	—	ns	
Turn-off delay time	$t_{d(off)}$	—	75	—	ns	
Fall time	t_f	—	15	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.39	—	V	$I_F = 2 \text{ A}$, $V_{GS} = 0$ ^{Note4}
Body-drain diode reverse recovery time	t_{rr}	—	40	—	ns	$I_F = 60 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

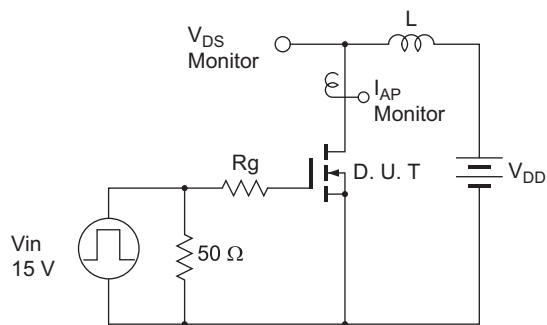
Main Characteristics



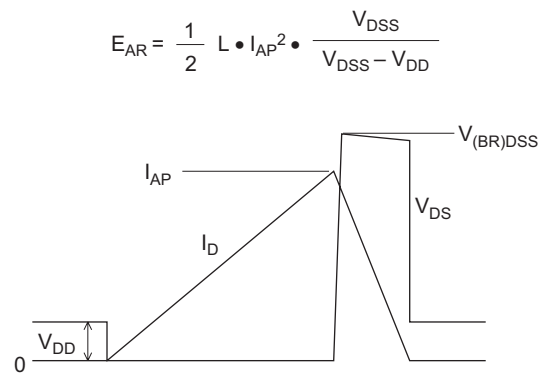




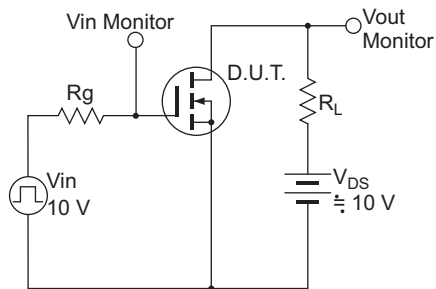
Avalanche Test Circuit



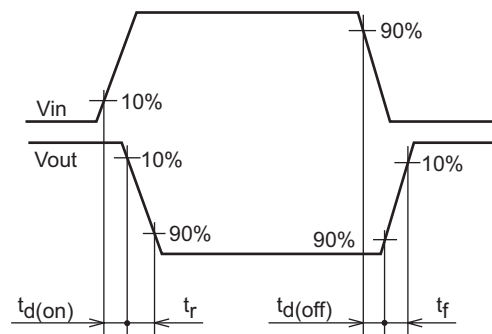
Avalanche Waveform



Switching Time Test Circuit



Switching Time Waveform



Notes:

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