

RJK0329DPB

Silicon N Channel Power MOS FET Power Switching

REJ03G1638-0400

Rev.4.00

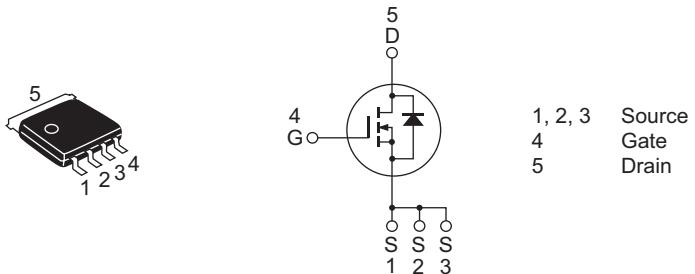
Apr 10, 2008

Features

- High speed switching
- Capable of 4.5 V gate drive
- Low drive current
- High density mounting
- Low on-resistance
- $R_{DS(on)} = 1.8 \text{ m}\Omega \text{ typ. (at } V_{GS} = 10 \text{ V)}$
- Pb-free

Outline

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



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	55	A
Drain peak current	I _{D(pulse)} ^{Note1}	220	A
Body-drain diode reverse drain current	I _{DR}	55	A
Avalanche current	I _{AP} ^{Note 2}	25	A
Avalanche energy	E _{AR} ^{Note 2}	62.5	mJ
Channel dissipation	P _{ch} ^{Note3}	60	W
Channel to Case Thermal Resistance	θ _{ch-C}	2.08	°C/W
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
 2. Value at T_{ch} = 25°C, R_g ≥ 50 Ω
 3. T_c = 25°C

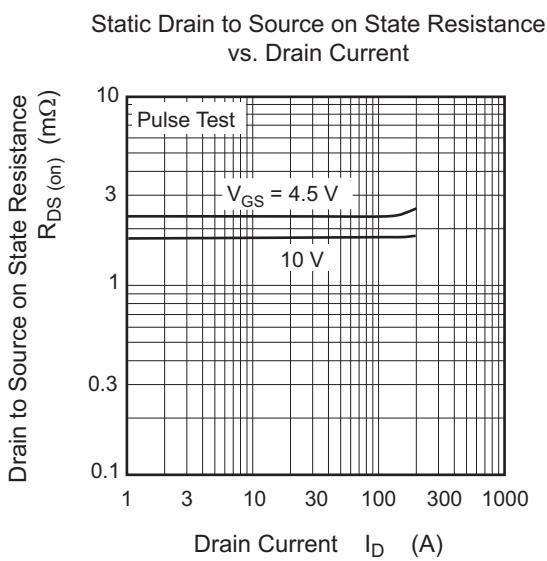
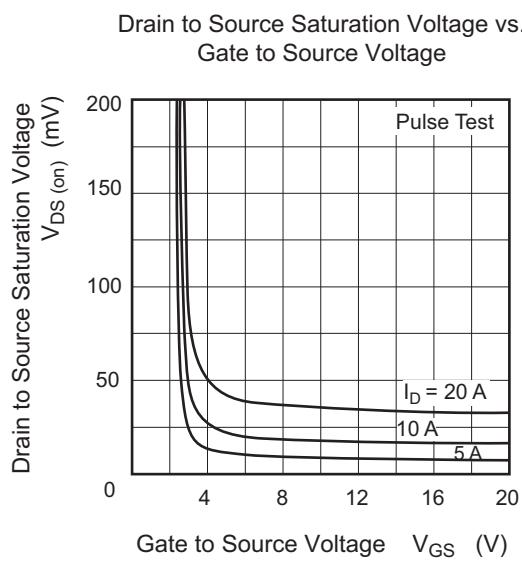
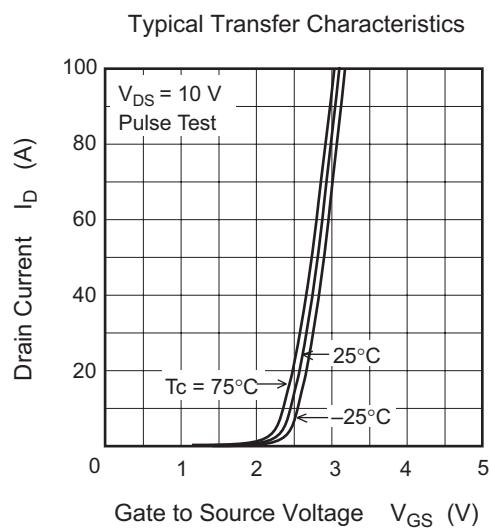
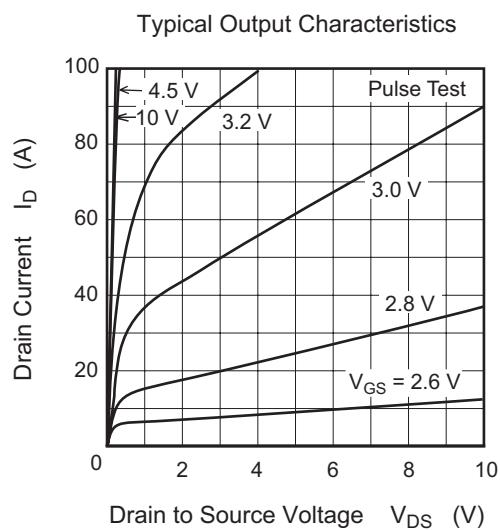
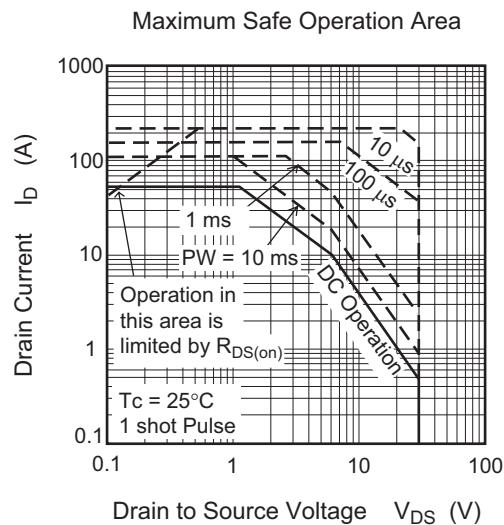
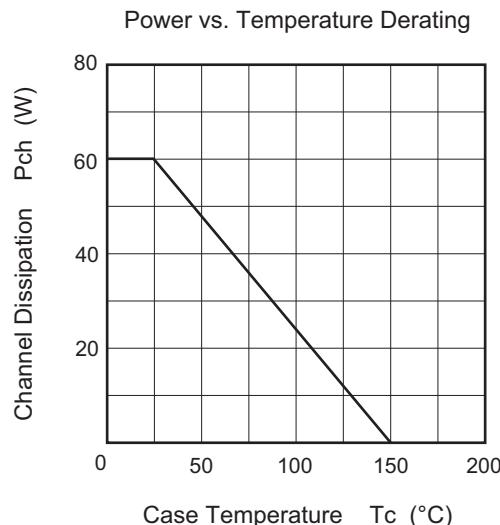
Electrical Characteristics

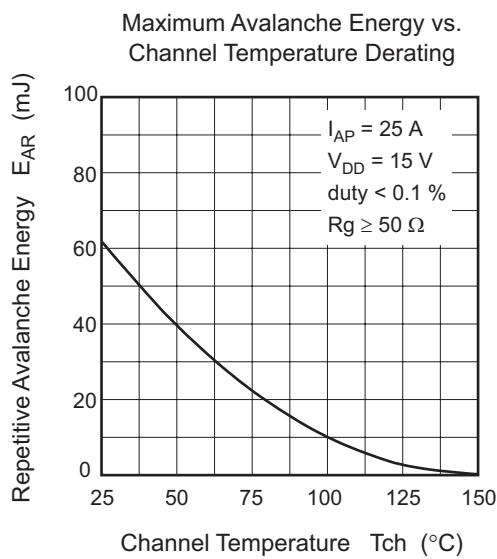
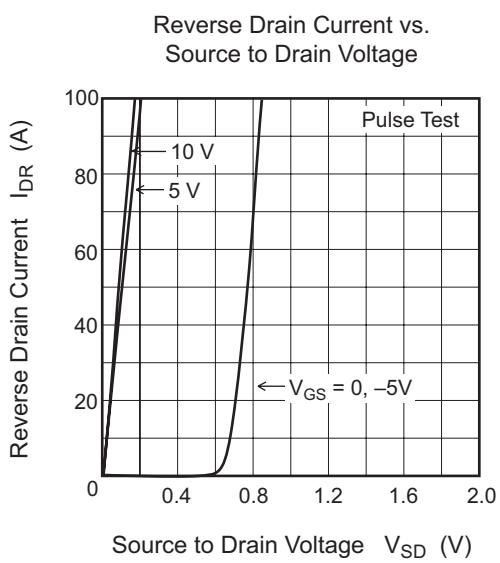
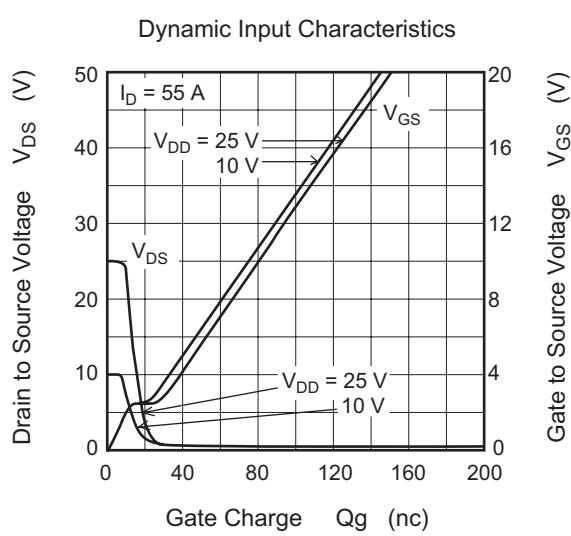
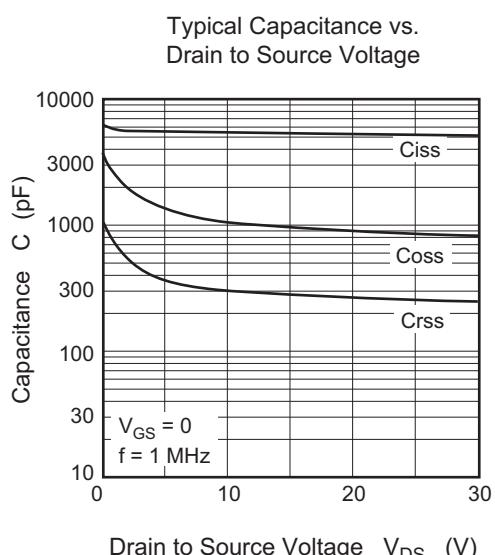
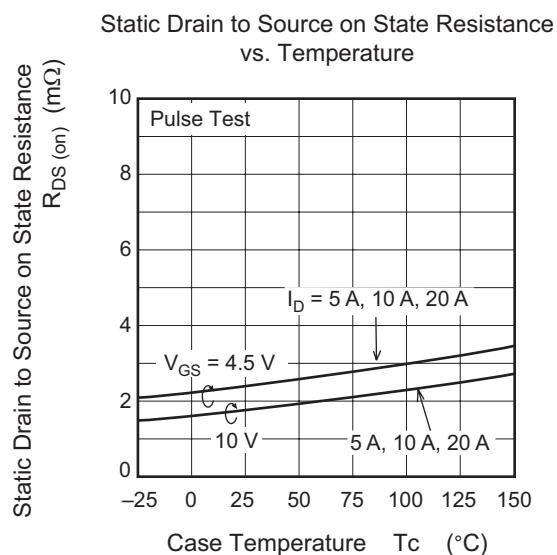
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V _{(BR)DSS}	30	—	—	V	I _D = 10 mA, V _{GS} = 0
Gate to source leak current	I _{GSS}	—	—	±0.1	µA	V _{GS} = ±20 V, V _{DS} = 0
Zero gate voltage drain current	I _{DSS}	—	—	1	µA	V _{DS} = 30 V, V _{GS} = 0
Gate to source cutoff voltage	V _{GS(off)}	1.2	—	2.5	V	V _{DS} = 10 V, I _D = 1 mA
Static drain to source on state resistance	R _{DS(on)}	—	1.8	2.3	mΩ	I _D = 27.5 A, V _{GS} = 10 V ^{Note4}
	R _{DS(on)}	—	2.4	3.4	mΩ	I _D = 27.5 A, V _{GS} = 4.5 V ^{Note4}
Forward transfer admittance	y _{fs}	—	100	—	S	I _D = 27.5 A, V _{DS} = 10 V ^{Note4}
Input capacitance	C _{iss}	—	5330	—	pF	V _{DS} = 10 V, V _{GS} = 0, f = 1 MHz
Output capacitance	C _{oss}	—	980	—	pF	
Reverse transfer capacitance	C _{rss}	—	295	—	pF	
Gate Resistance	R _g	—	0.5	—	Ω	
Total gate charge	Q _g	—	35	—	nC	V _{DD} = 10 V, V _{GS} = 4.5 V, I _D = 55 A
Gate to source charge	Q _{gs}	—	13	—	nC	
Gate to drain charge	Q _{gd}	—	7.3	—	nC	
Turn-on delay time	t _{d(on)}	—	7.7	—	ns	V _{GS} = 10 V, I _D = 27.5 A, V _{DD} ≈ 10 V, R _L = 0.36 Ω, R _g = 4.7 Ω
Rise time	t _r	—	4.0	—	ns	
Turn-off delay time	t _{d(off)}	—	59	—	ns	
Fall time	t _f	—	6.8	—	ns	
Body-drain diode forward voltage	V _{DF}	—	0.78	1.02	V	I _F = 55 A, V _{GS} = 0 ^{Note4}
Body-drain diode reverse recovery time	t _{rr}	—	40	—	ns	I _F = 55 A, V _{GS} = 0 di _F / dt = 100 A/ µs
Body-drain diode reverse recovery charge	Q _{rr}	—	42	—	nC	

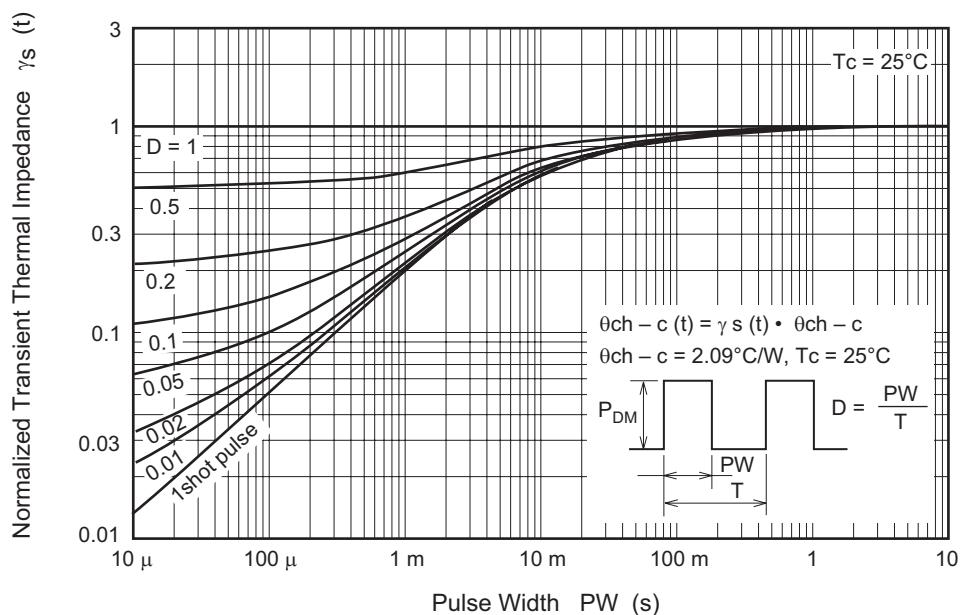
Notes: 4. Pulse test

Main Characteristics

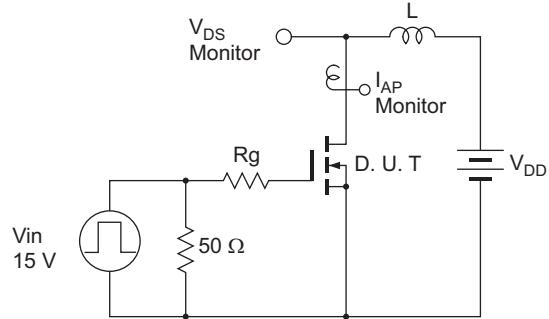




Normalized Transient Thermal Impedance vs. Pulse Width

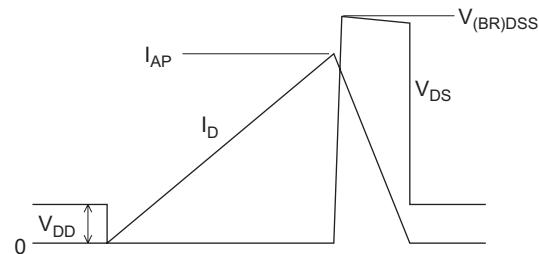


Avalanche Test Circuit

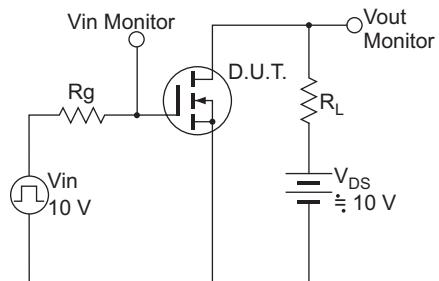


Avalanche Waveform

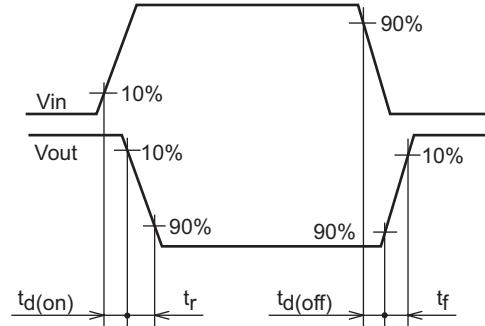
$$E_{AR} = \frac{1}{2} L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



Switching Time Test Circuit



Switching Time Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
LFPACK	SC-100	PTZZ0005DA-A	LFPAKV	0.080g	

(Ni/Pd/Au plating)

Ordering Information

Part No.	Quantity	Shipping Container
RJK0329DPB-00-J0	2500 pcs	Taping

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

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Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology (Shanghai) Co., Ltd.
Unit 204, 205, AZIACenter, No.1233 Lujiazui Ring Rd, Pudong District, Shanghai, China 200120
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Renesas Technology Hong Kong Ltd.
7th Floor, North Tower, World Finance Centre, Harbour City, Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2377-3473

Renesas Technology Taiwan Co., Ltd.
10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 3518-3399

Renesas Technology Singapore Pte. Ltd.
1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

Renesas Technology Korea Co., Ltd.
Kukje Center Bldg. 18th Fl, 191, 2-ka, Hangang-ro, Yongsan-ku, Seoul 140-702, Korea
Tel: <82> (2) 796-3115, Fax: <82> (2) 796-2145

Renesas Technology Malaysia Sdn. Bhd
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: <603> 7955-9390, Fax: <603> 7955-9510